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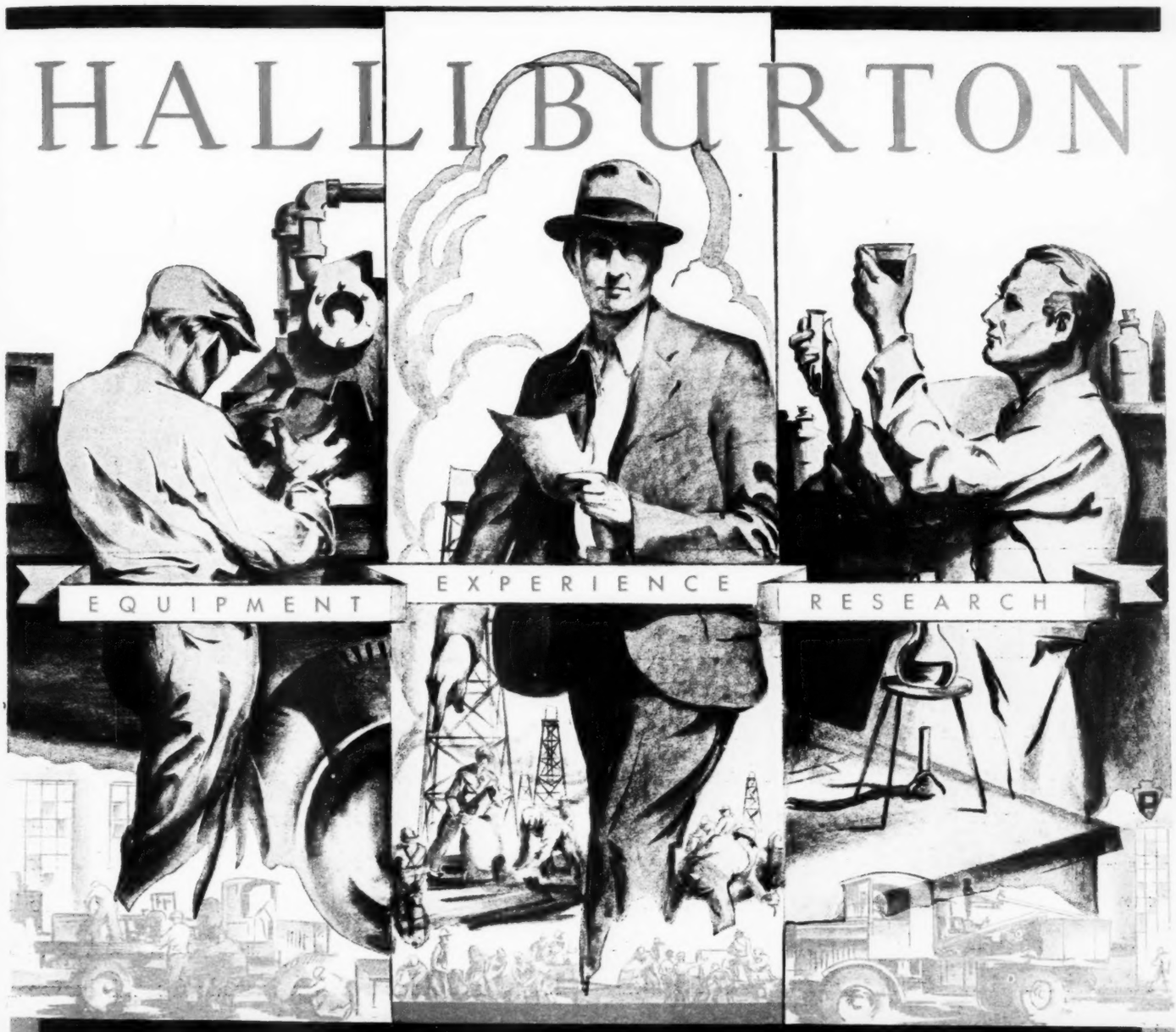

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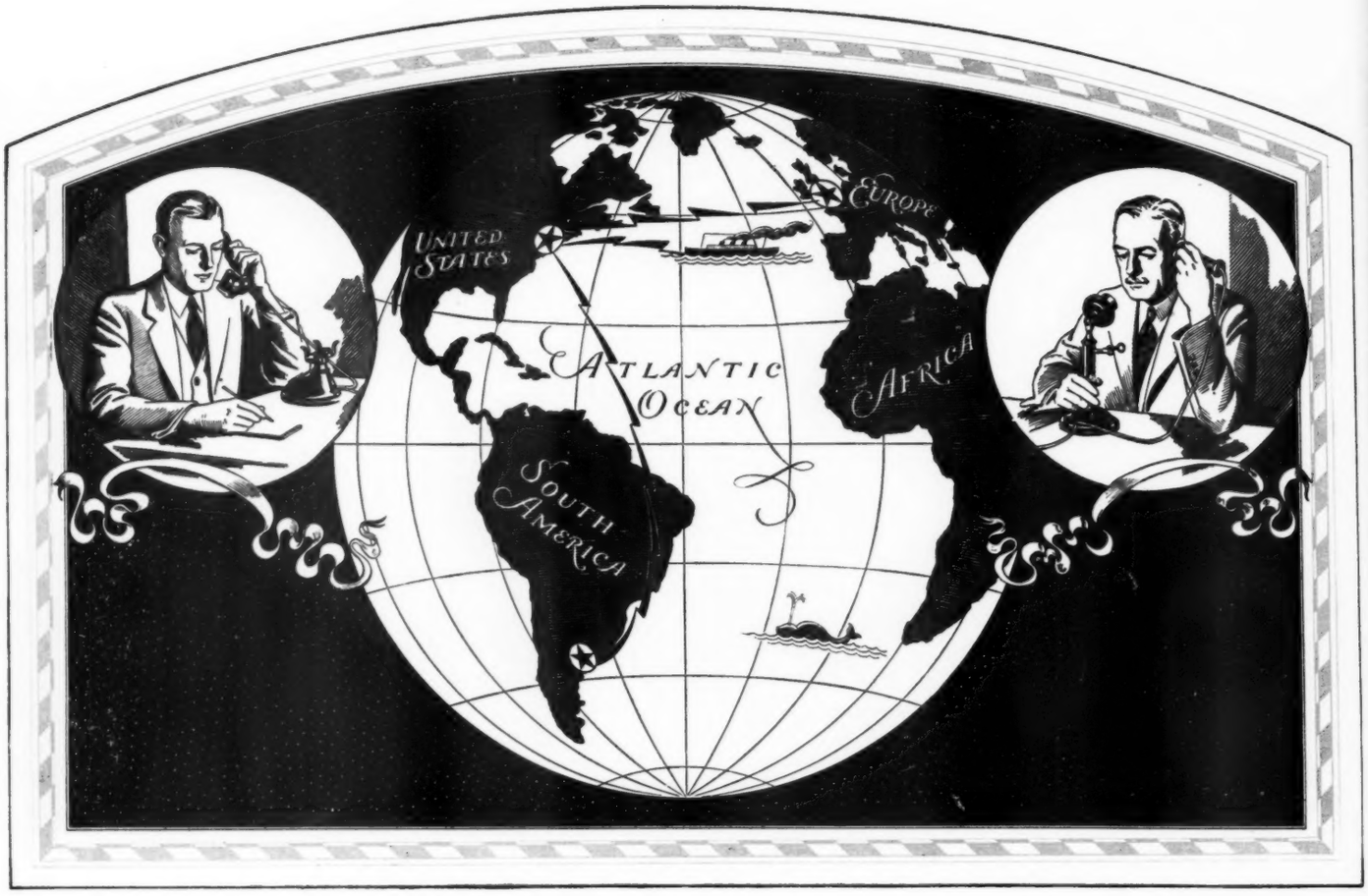

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Proration Strengthened By State Court

Highest daily average estimated total production in 1929, week ended Aug. 24, 2,975,435 bbls. Lowest in 1929, Dec. 27, 2,595,320 bbls.

Oklahoma Corporation Commission Upheld. New Pools Emphasize Need for Continued Efforts at Curtailment

Highest daily average estimated light oil production in 1929, week ended Sept. 14, 2,534,524 bbls. Lowest in 1929, Apr. 13, 2,142,036 bbls.

By Andrew M. Rowley

While the conservation movement was being strengthened as a result of the decision of the Supreme Court of Oklahoma upholding the constitutionality of the state law empowering the State Corporation Commission to prorate crude oil production and success of the movement was further attested by another decline in crude oil production, recent discoveries in widely scattered areas emphasized the need of constant viligance and continued efforts if production is to be held more nearly to market requirements during this winter. There have been but two brief periods since 1926 when crude oil production was as low as the average recorded last week.

If crude oil producers succeed in holding their output near the present level during this winter and the refiners so plan their operations as to prevent a piling up of excess stocks of gasoline conditions next year should show a substantial improvement. There is no desire evident upon the part of the major crude oil purchasers to further reduce prices at this time although the action of a number of smaller concerns in posting prices they will pay for crude oil under the regularly posted prices of the large buyers constitutes a menace to the general price structure. Should such practice continue or extend further, the larger buyers might be forced to meet the lower prices in order to protect their customers.

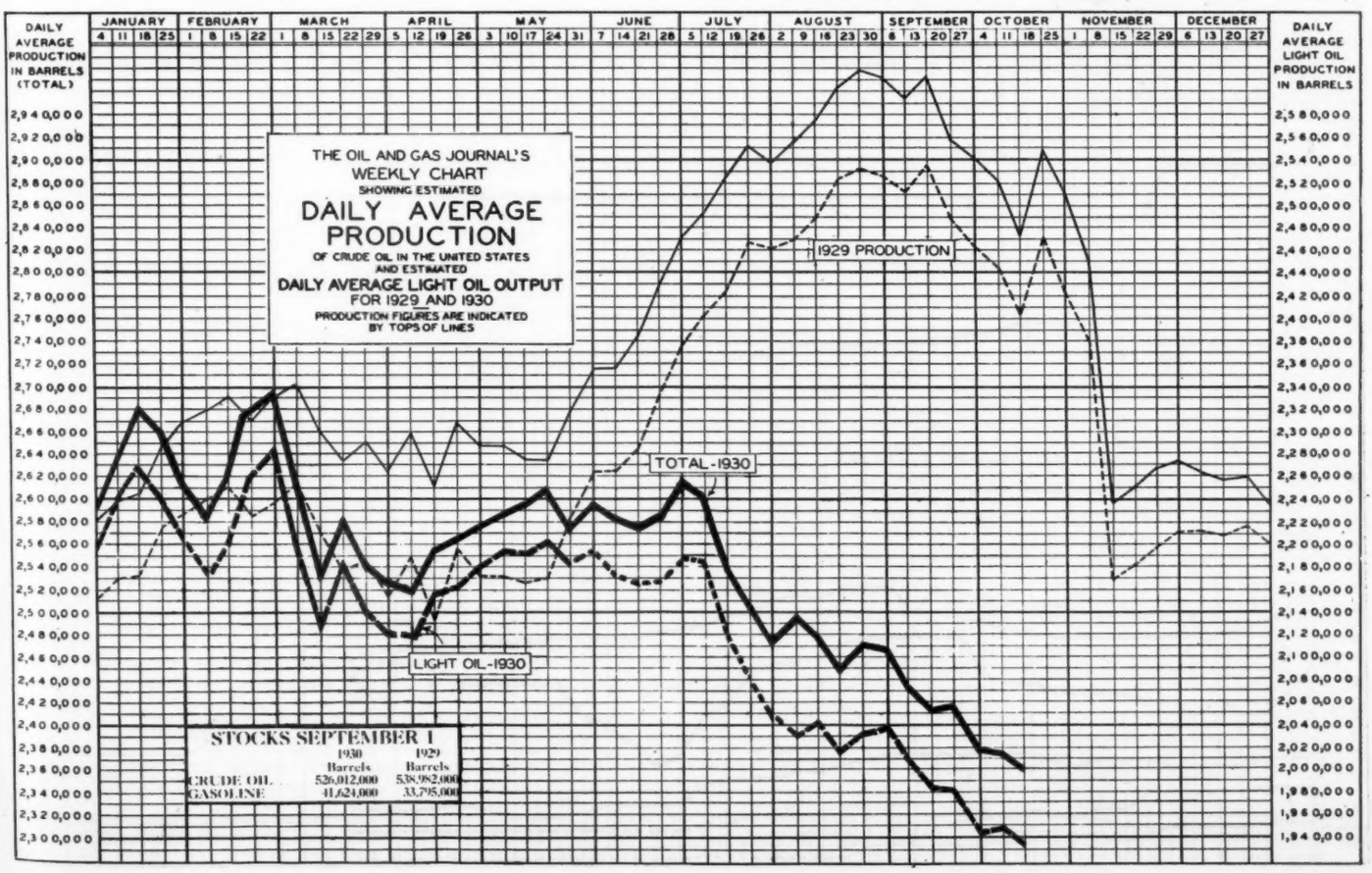
A determined effort is being made to abolish proration in Oklahoma and the corporation commission this week is holding a hearing on the question. Lifting of proration undoubtedly would result immediately in a very drastic reduction in crude oil prices. It is not believed the corporation commission will reverse the position it has held thus far which has been to co-operate with the large majority of operators in efforts to prevent waste and a production of crude oil in excess of market requirements.

PRODUCTION IN THE UNITED STATES

Estimated daily average production of light and heavy gravity oil in the United States for week ended October 11 and a comparison with the previous week follows:

	October 11		October 4	
	Light	Heavy	Light	Heavy
Oklahoma—				
Oklahoma City	92,285	.....	110,485	.....
St. Louis-Pearson	24,970	.....	25,470	.....
Seminole	142,390	.....	134,610	.....
Northern miscellaneous	229,615	.....	228,105	.....
Southern fields	59,385	.....	59,215	.....
Total Oklahoma	548,645	.....	557,885	.....
West Texas—				
Hendricks	61,085	.....	61,845	.....
Yates	107,480	.....	104,975	.....
Remainder	104,224	.....	103,314	.....
Total West Texas	272,789	.....	270,134	.....
North Louisiana	35,030	5,245	34,635	5,275
Arkansas	15,995	36,410	16,775	36,375
North Central Texas	106,474	.....	103,698	.....
Texas Panhandle	79,300	.....	78,274	.....
East Central Texas	43,311	.....	42,716	.....
Kansas	115,620	.....	115,740	.....
Total Mid-Continent area	1,217,164	41,655	1,219,857	41,650
Gulf Coast	.....	190,031	.....	188,538
Southwest Texas	.....	106,857	.....	109,881
Eastern	114,000	.....	118,000	.....
Rocky Mountain area	100,950	.....	113,719	.....
California—				
Santa Fe Springs	95,250	.....	95,000	.....
Long Beach	101,250	.....	101,000	.....
Playa Del Rey	20,500	.....	19,500	.....
Elwood	34,000	.....	32,500	.....
Ventura Avenue	46,500	.....	46,500	.....
Kettleman Hills	25,500	.....	25,000	.....
Remainder of State	180,000	88,000	180,000	87,500
Total California	503,000	88,000	499,500	87,500
Total United States	1,935,114	426,543	1,951,076	427,569
Grand total	2,361,657		2,378,645	

Total Decrease 16,988 Bbls.; Light Oil Decrease 15,962 Bbls.



Crude Situation Factor in Market

Reductions by Independent Refiners in Mid-Continent Field Disturbs Refinery Structure. Gasolines at New Low

By C. O. Willson

Spot sales of refinery gasoline reached a new low for the year in Oklahoma during the past week, the development contributing to a market situation in which practically all products are unsettled. The U. S. Motor grade in Oklahoma sold for resale as low as 5 cents. The records of veteran refining organizations show this price to be the lowest for the principal domestic grade of gasoline in the Mid-Continent Field since 1916.

Most of the larger refiners in the State are quoting 6 to 6½ cents for the U. S. Motor grade and this range covers the bulk of the contract movement with jobbers. At the same time, jobbers, who are accustomed to purchase at the low of the market, have been able to secure plenty of material at prices a full cent under the general spread. This applies to Oklahoma refiners and operators with plants in differential territory. Selling on an Oklahoma (Group 3) basis scattered sales of West Texas gasoline were made the past week netting the sellers at their plants as low as 4⅝ cents for the U. S. Motor grade.

The demand for natural gasoline which has occupied an exceptionally strong position since early August, has also slackened and prices on all grades declined one-quarter cent during the week.

There is nothing new to be reported on the other products in the Oklahoma market. With the exception of the high gravity, low cold test fuel oils and the best grades of furnace oil material, it continues to be a buyers' market with very little spot trading.

Lower Crude Prices

The crude oil price situation in the Mid-Continent which is becoming more and more acute in several areas, is the market factor generally discussed by refinery executives and sales managers. Most of the trade agree that no general improvement in refinery markets is to be expected as long as developments continue to point to a general break in the posted schedules for crude oil.

The uncertainty as to future crude oil prices became of direct concern to Oklahoma refiners the first of the week when the Champlin Refining Co., one of the largest refiners in the State announced new posted schedules involving reductions of 25 to 31 cents for the higher gravity grades in Oklahoma. Approximately 8,000 bbls. daily of purchased crude is said to be involved in this action.

Coupled with this announcement was the fact that limited quantities of Oklahoma City crude oil are being offered under the posted schedule of the major buyers.

The Oklahoma development follows that in North Texas where several independent refiners have been buying their crude supplies under the posted schedules. During the past week two refiners in that area announced new schedules based on delivered prices at their refineries, regardless of gravity. Taking into consideration the gathering costs and pipe line charges, these new schedules amount to price reductions as much as 48 cents under the posted schedules. A somewhat similar situation obtains in the Panhandle area of Texas.

Due to the direct competition which exists between Oklahoma and North Texas and Texas Panhandle refiners in the sale of refined products, the lower crude prices in those areas are as important to Oklahoma sellers, as they would be if they had been made effective within the State.

It is assumed that some of the smaller Oklahoma refiners will follow the lead of the Champlin company where it is possible for them to do so. Some have long-time contracts based on the posted schedules of the major crude oil buyers and cannot buy crude from other sources until these contracts expire.

The position of these Oklahoma and Texas refiners who have lowered their crude oil prices has been officially explained. In all cases they either do not produce crude oil or their output is small when compared to their total purchases. They state that posted crude schedules have been out of line with the refinery market for several months and they are now attempting to adjust their schedules in line with refinery revenue so that they can at least break even in their operations.

It is admitted that this gradual spread in lower schedules for crude oil endangers the posted price structure as adhered to by the larger buyers. The latter had

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REFINED MARKET BAROMETER

Most of the price changes of the past week in refined markets were declines with no advances of general importance reported. The gasoline market continues unsettled with the greatest weakness centering in the southwestern and middle western refining groups. The domestic gasoline demand is considered satisfactory for the season and there was more activity the past week in export channels but sellers continue to offer price concessions in spot business. Natural gasoline prices declined for the first time in several weeks. The kerosene market was generally steady. Additional price concessions in fuel oil became effective in the Gulf Coast region but otherwise the market was steady. Furnace oils are active with a fair demand for gas oil. Substantial reductions in Gulf Coast pale and red oils featured the price changes of the week in the lubricant list. The wax market continues slow.

Mid-Continent—Refinery gasoline market weak and spot prices generally lower. Natural gasoline prices lower. Kerosene steady. Good movement of furnace oil material with fair to strong demand for low cold test fuel oils. Lubricants weak. Fair demand for gas oil.

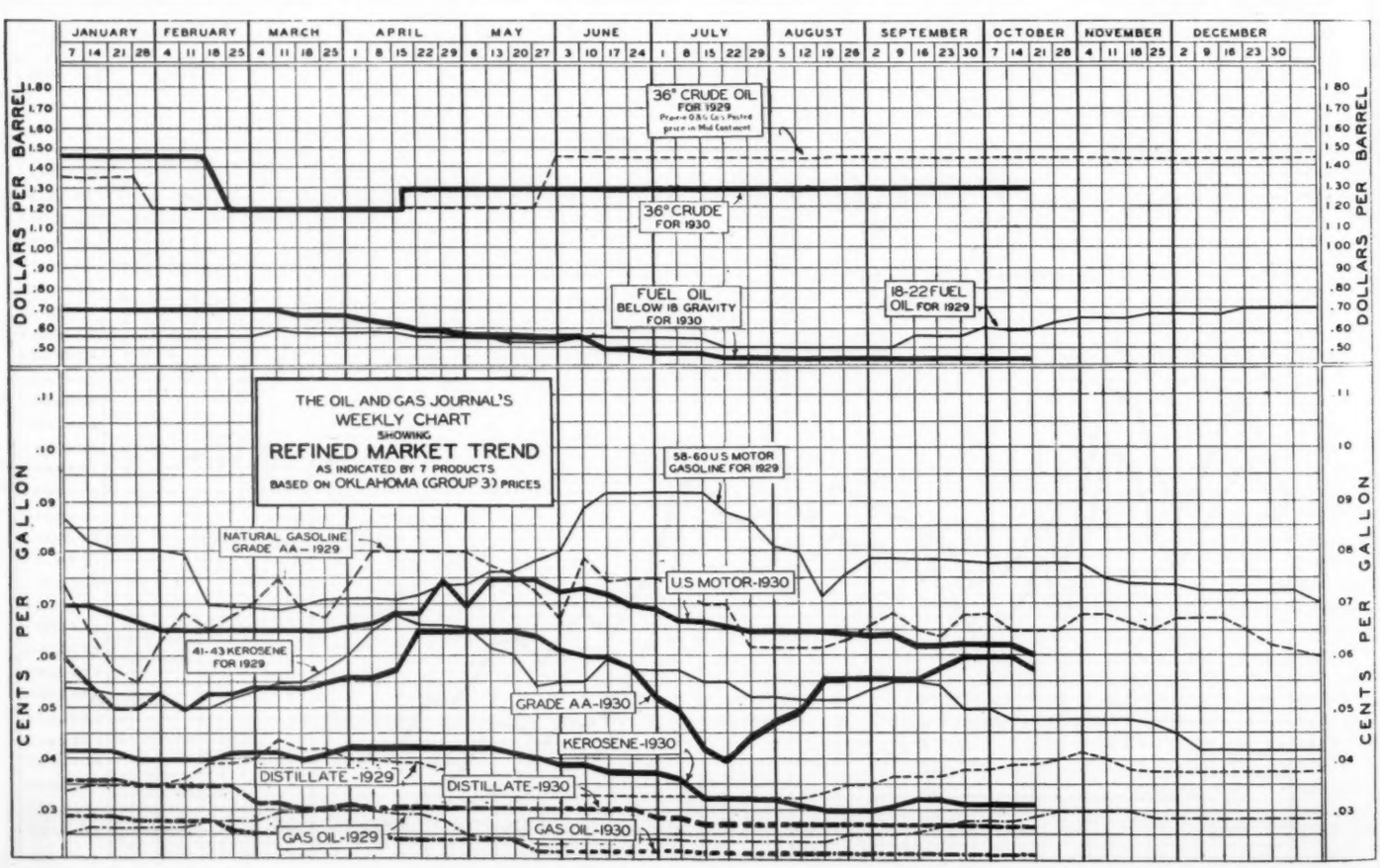
East Coast—Gasoline market more stable. Improved demand for kerosene with prices unchanged. No change in fuel oil and gas oil. Wax market quiet. Furnace oils active. Lubs irregular.

Chicago—Gasoline market weak and prices lower. Fair demand for furnace oils. Better tone to kerosene market. Other products unchanged.

Pennsylvania—Gasoline and kerosene quiet. No change in neutral oils and cylinder stocks.

Gulf Coast—Market generally weak. Fuel oil prices lower. First reduction in several months in pale and red oils. Gasoline prices lower.

California—Gasoline market unsettled with no changes in refinery quotations. Other products unchanged.



Gas Men to Meet in Memphis Next May

Accept Exposition's Invitation to Hold 1932 Convention in Tulsa. H. C. Cooper, Chairman; H. L. Montgomery, Vice Chairman

By A. E. Mockler
New York Bureau, The Oil and Gas Journal

ATLANTIC CITY, N. J., Oct. 13.—Natural gas, the new giant of the utility field, holds the spotlight here as the twelfth annual convention and exhibition of the American Gas Association gets under way for its five days' session in the Atlantic City auditorium.

A comprehensive discussion of progress in natural gas production, transmission, and marketing featured the session of the natural gas department and a further broadening of consumption of the natural product was forecast by the speakers. H. C. Morris, president of the Dallas Gas Co., whose term as chairman of the natural gas department terminates at this meeting, sounded a word of warning against overoptimism in extension of natural gas distribution to new territories, but viewed the outlook for the industry in general with considerable optimism. H. C. Cooper, of the Hope Natural Gas Co., of Pittsburgh, was elected chairman of the natural gas department for the ensuing year. Other officers were elected as follows: Vice chairman, H. L. Montgomery; directors, B. C. Adams, H. R. Dickerson and Edgar G. Hill. Directors reelected were Frank L. Chase, T. B. Gregory, J. R. Munce and Thomas R. Weymouth.

R. W. Gallagher, president of the East Ohio Gas Co., Cleveland, chairman of the natural gas convention time and place committee, announced that the May, 1931, meeting will be held in Memphis and that the natural gas department of the association has accepted the invitation of the International Petroleum Exposition to hold its 1932 convention at Tulsa in conjunction with the International Petroleum Exposition to be held during May of that year in that city.

H. C. Morris, retiring chairman of the natural gas department, in opening the session of that division, outlined the rapid strides taken by the natural gas industry during the past year. The department has materially expanded its activities during this period. He said the success of the first regional natural gas sales conference held in Pittsburgh in February of this year has resulted in arrangements being made for a southwest regional natural gas sales conference to be held in Dallas on November 13 and 14.

Rapid Expansion

"The entire natural gas industry is moving ahead rapidly," Mr. Morris declared. "Sales are estimated to have increased 20 per cent last year over the previous year and extensions to new territories are now going ahead at a more rapid pace than ever before. It is estimated that there were in this country at the beginning of 1930 about 80,000 miles of natural gas transmission lines. A recent estimate shows that 12,000 miles of additional natural pipe lines were either started or projected so far this year. With the completion of the extension of natural gas service now definitely planned, nautral gas will be distributed in 38 states. Of these, eight states and the District of Columbia have come into the natural gas picture this year. Natural gas is now produced in commercial quantities in 25 states."

Mr. Morris sounded a word of caution against ill advised expansion of natural gas distribution. "While viewing these rapid strides of our industry," he said, "we are hopeful that all of the new ventures will be carefully engineered, properly financed and so constructed and operated as to maintain the present good standing and popular favor which our utility now enjoys. At this time, when so many pipe lines are being projected both in the natural gas states and into sections of the country not now served with natural gas, and in cases of supplying natural gas as a replacement for

H. C. Cooper

manufactured gas it may not be amiss to suggest a word of caution to those responsible for the financial success of such pipe lines and also to the operators of manufactured gas distributing companies charged with the protection of their company investment when they take on the distribution of natural gas.

"Officers of the operating companies know and the information should be made available to the engineers and others making reports for investment banking houses that it is not safe to measure present day probabilities of speed in building up the load by the results obtained by the companies early in the field. Ten years ago natural gas sold for less than now. There has been an increase in the amount of useful energy secured from a ton of coal. Mechanical stokers have brought the comparative furnace efficiencies closer together. Furnace oil in home central heating plants and used in automatically controlled devices is a development of the past 10

H. L. Montgomery

years. Time is required to replace electric heating elements when once installed. Co-operation between companies and individuals and the exchange of statistics and information is especially desirable at this time in order that the dangerous mistakes and pitfalls along the line of progress may be avoided."

Conservation Program

H. C. Cooper, of the Hope Natural Gas Co., chairman of the main technical and research committee, recommended a plan of procedure decided upon by the committee for the purpose of enabling the natural gas industry to lay a groundwork for natural gas conservation activities in co-operation with the Bureau of Mines and the American Petroleum Institute. The engineerings staffs of companies engaged in natural gas transmission, Mr. Copoer said, have done much work in perfecting lines, and the committee plans as soon as time will permit, to form a subcommittee to assemble all available data on this subject and make a special report available to the industry to further assist the engineering division of the industry in its future work.

Henry C. Morris

The distribution committee of the American Gas Association, he added, has for some years conducted studies which have a bearing on losses of gas in distribution. "To render the present knowledge as to the best methods of minimizing leakage in gas distribution systems available to the industry," he said, "the technical and research committee proposes to establish a subcommittee which will segregate these matters from the reports of the distribution committee, adding thereto such other existing information as is available and present the same for the use of the industry."

Progress has also been made in checking losses of natural gas incidental to its production, Mr. Cooper said, through the work of the committee on gas well deliveries, under the chairmanship of N. C. McGowan. A number of additional subcommittees will be formed to facilitate development of a conservation program, he concluded, adding, "the technical and research committee, after further consideration, may shortly recommend that the activities concerning the study of gas well deliveries should be further increased so as to complete this undertaking in a shorter time than is now anticipated. The work involves study and necessitates experiments over a wide area so that it may be advisable to put a further quota of engineers of the bureau on this work."

Robert W. Hendee, of the Oklahoma Natural Gas Corp., outlined in interesting fashion the growth of natural gas to

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CORPORATION COMMISSION HEARING TESTIMONY ON OKLAHOMA PRORATION

By James MyIntyre

OKLAHOMA CITY, Okla., Oct. 14.—Whether the recommendations of the Oklahoma State Proration Committee of the Mid-Continent Oil and Gas Association would be approved by the State Corporation Commission and issued in the form of an order by the commission to govern oil production in the State during the last three months of 1930 was still in doubt this evening following several days of testimony before the commission.

A. V. Hoenig, vice president of the Indian Territory Illuminating Oil Co., on the stand part of Monday afternoon and this morning, recited the history of the restriction of operations in Oklahoma City and when asked by Attorney Reuben M. Roddie why the Indian Territory Illuminating Oil Co. had drilled so many wells in the face of such a large potential production, Mr. Hoenig said that when the company's first well, the discovery well in the field, was completed the Indian Territory Illuminating Oil Co. offered to shut the well in if owners of offsets and others having leases in the neighborhood would agree not to start any new drilling wells. The Indian Territory Illuminating Oil Co. was unsuccessful in bringing about such an arrangement, Mr. Hoenig said, and in the big general drilling campaign that followed it had drilled few wells that were not offsets or otherwise required by the provisions of their leases. Mr. Hoenig admitted that rigid drilling restrictions generally practiced in the beginning would have averted the present condition of overproduction.

Mr. Hoenig expressed the opinion that if proration restrictions were lifted much oil would go to waste in the Oklahoma City Field because of lack of market, lack of pipe line facilities even if there was a market, lack of field storage and the fact that to protect leases from drainage it would be necessary to open offset wells and possibly to store the oil in earthen pits. He said he believed some oil would be lost by evaporation and by flowing onto the ground and running down the creek.

Umpire Says Oil Would Be Wasted

Otto Bradford, umpire for the Oklahoma Field, explained today his duties and those of his staff in gathering the daily records of production and pipe line runs in the field. He gave it as his opinion that oil would be wasted if proration should be lifted. In reply to a question he said he had worked in the Healdton Field when it was at its height in production and number of operations and that he had seen oil run to earthen storage and down the creeks because the field was permitted to run wide open and with only one pipe line into the field

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New Light Thrown on Coastal Domes

Discoveries in Two Fields of Mushroom-Shaped Salt Formations May Lead to Re-drilling of Older Known Domes

By Neil Williams
Staff Correspondent, Gulf Coast Fields

HOUSTON, Tex., Oct. 13.—Late discoveries at Barbers Hill and Allen, where large masses of cap rock and salt have been drilled through to find oil-producing sands underneath, are throwing an entirely new light on Gulf Coast salt domes. Former theories are threatened with discard as the coast's most recent geological revelation threatens to upset previous conceptions of domes, and to open for development sources of production heretofore untouched and under formerly condemned territory.

Until within the last few months the general conception of a salt dome had been of a large mound-shaped mass (Figure A) pushed upward through the earth's strata as a conical wedge from a base of wide extent thousands of feet below the surface. That it was possible to drill through any part of it had been given little credence, and any practical thought to learn otherwise had been discouraged by more or less imaginary drilling obstacles, namely, crystallization of drill stem and soluble hole walls. Consequently, rarely had tests gone into the salt more than 100 to 200 feet, and, for the most part, topping of the salt, and in many instances merely the overlying cap rock, spelled abandonment of the well.

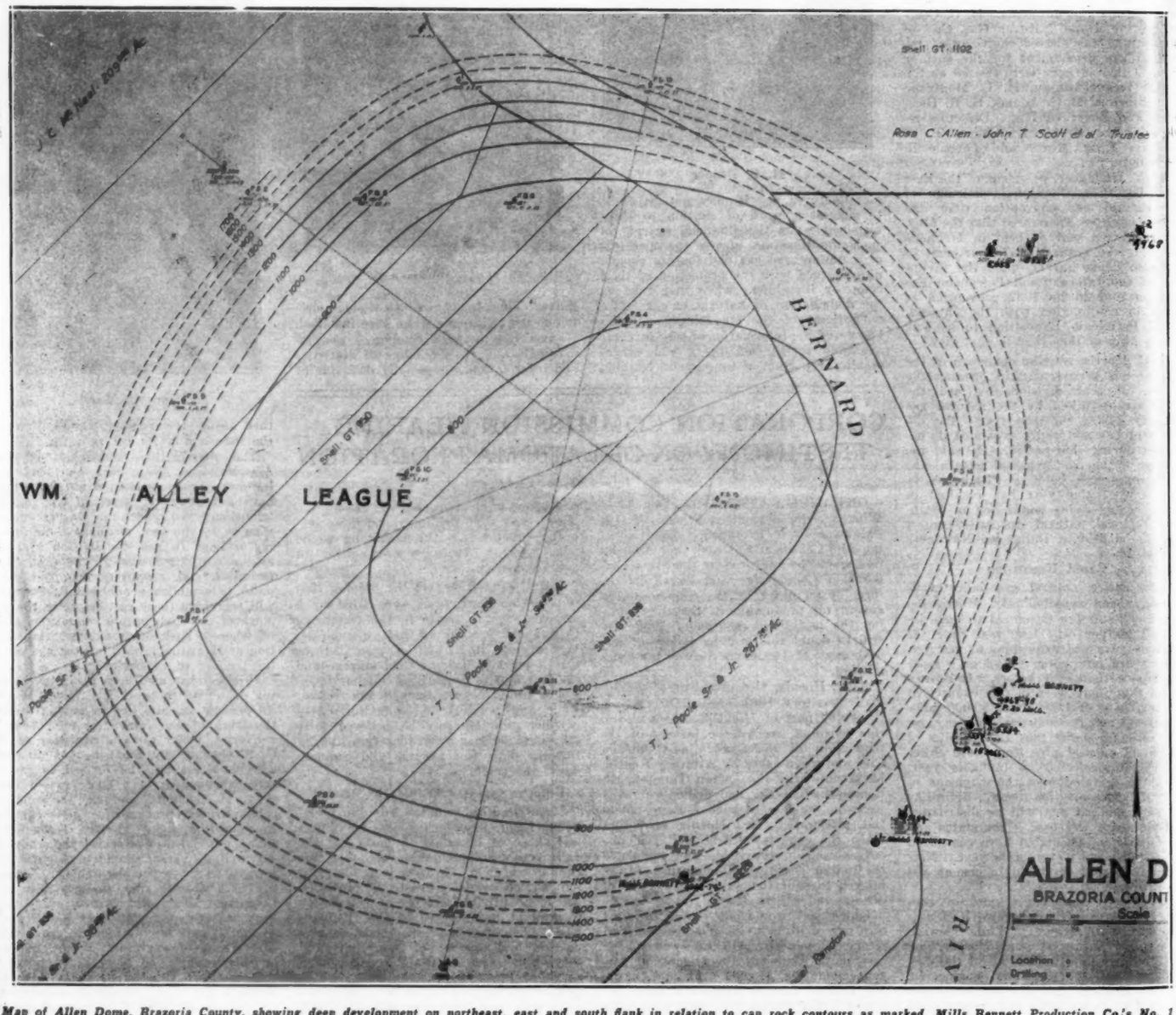
In exploration at Barbers Hill, where subsalt development has been pioneered in recent months, the drilling through cap rock and salt, and back into formation again in a series of tests extending from the far west side, around the north and east flanks and to the south edge, has indicated that a large part of the previously outlined dome is a sort of false, overhanging top or protrusion from a somewhat smaller core or central plug of salt. This top, thicker toward the center, tapers off to the outer rim, which is fringed at places by a ledge of cap rock protruding out over the salt.

This shows that Barbers Hill is not a mound or hill of salt in the sense previously thought, but rather consists of a column of salt, comparatively small in circumference, with a ballooned or mushroomed top (Figure B). That this top for the most part is at least 300 to 400 feet thick, this thickness increasing closer to the center and necessitating one test to pass through a record of 1,646 feet of salt before going into formation again, accounts for the failure of operators to learn this before.

Theory of Formation

The theory advanced for this formation is that the column of salt was pushed up by some enormous force through a break or weak place in the lower strata. As the column neared the surface where the surface pressure was lighter and the formations softer, the top of the salt had a tendency to bulge and spread out, thus forming the wide false top, or balloon or mushroom effect. At Barbers Hill the spread is chiefly to the northward, accountable to the fact that the surface strata of the Gulf Coast slopes upward in that direction, the salt following the upward slope. This theory also explains the sharp drop of the salt on the south side of the dome, which development there has shown.

Leaders in this revolutionary development at Barbers Hill have been the Mills Bennett Production Co. and Humphreys Corp., which companies for sometime have held the opinion that this dome had an overhanging ledge of some kind, with possibilities of underlying oil sands. It has been the contention of these operators that the drilling of only a few hundred feet into the salt has not provided sufficient proof on which to base any theories, as had been done, on the formation of domes, but because of the recent flush production development at Barbers



Map of Allen Dome, Brazoria County, showing deep development on northeast, east and south flank in relation to cap rock contours as marked. Mills Bennett Production Co.'s No. 1 Poole on south side is shown on cap rock contour, to which future deep sand development may be shifted.

Hill these operators have hesitated until now to initiate a salt exploration program. Thus by their recent efforts to drill deeper into the salt they have borne out their theories which probably will result in similar drilling programs around all other domes.

Discovery of Much Promise

That this discovery offers a very extensive source of new salt dome production is indicated by wells which already have been completed in sands underlying the ledges of cap rock and salt at both Barbers Hill and Allen. In deep development on the Gulf Coast the source of production lies in sands which flank close onto the sides of the salt. By the new theory of salt dome formation as advanced at Barbers Hill, it is more than likely that operators in the past in their desire to move off the top of the salt only have succeeded in getting out from the false top and in doing this they have, in reality, drilled too far distant from the main salt core to find the real production.

This may account for a large part of the mediocre and disappointing results which have been met in many attempts to find deep production around the flanks of the domes. Except in sands which flank the false top itself, the deep production found may have been on the outside edge and on the down sand side of the pool. This is indicated in the usual large volume of salt water yielded with present flank sand production, the inability of many deep wells to hold up, or in the many complete failures. Ability to drill through the overhanging ledge and top sands higher up and closer, in the main, theoretically will result in more satisfactory production.

May Go Back to Abandoned Domes

If other domes are found to have been formed similarly to Barbers Hill, deep sand development on the Gulf Coast probably will experience a complete reversal in procedure. In this, operators instead of trying to move off the salt contours will attempt to drill up as close to the center as possible without drilling into the central core, which, of course, could not be passed through. This will mean the reclaiming and redrilling of large territories around edges of the salt contours of possibly all the present known domes and possibly will place an entirely new value relationship on acreage on and around all domes found in the future.

Story of the Discovery

The existence of this overhanging ledge at Barbers Hill probably first was indicated in the drilling during 1929 of Mills Bennett Production Co.'s No. 2 Barber, located on the extreme north side of the previously outlined dome area. This test, from 1,900 feet downward, passed through approximately 700 feet of cap rock and then back into formation. This attracted some attention as cap rock usually is underlaid with salt but at that time it was thought generally that this was just another one of the many salt dome peculiarities in which some agency had pushed a portion of the cap out over the edge of the salt. This test later was abandoned in shale at a total depth of 6,962 feet and was looked upon as condemning that portion of the north flank of the dome.

Subsequent drilling along the east side of the dome during 1929 and the earlier part of 1930 in the active development program which took place along that flank several deep wells passed through thin streaks of salt. This, however, was nothing unusual as around some of the other domes in earlier development there had been similar experiences. The streaks were considered merely small fingers, due possibly to minor irregularities in the formation of the salt mass. According to what has been learned since as to the condition of Barbers Hill, it is indicated that these fingers marked the extreme outer rim of the ledge where this false top perhaps has thinned out. At that time, however, no effort was being made to drill through the salt along that side and the unbroken line of deep production proved up there just skirts the edge of the salt contour.

Humphreys' Test Further Index

Also early this year, Humphreys Corp. drilled a deep wildcat on the north side of Barbers Hill, its No. 1 Morgan, which passed through a ledge of cap rock and back into formation again. Like in Mills Bennett's No. 2 Barber, which was approximately 2,000 feet to the west, this test failed to find salt and was drilled to a total depth of 6,404 feet, where in an oil sand it eventually was completed as a small producer, the first well on the north side of the dome. If salt had been drilled into under the cap, the test probably would have been abandoned and future wildcatting efforts in that area would have been directed to moving farther out from this ledge. However, with the present knowledge of Barbers Hill it is known that this well in reality is too far out instead of being too close in. This has been proved by two new tests, located several hundred feet closer in, which have been started since the completion of the Morgan well and on the strength of the theory that the Morgan well was on the outside edge of a large ledge of cap rock and salt and not the main salt plug. These two tests, Humphreys Corp.'s No. 1 Fitzgerald and No. 1-B Barber encountered the usual cap rock salt, which in customary dome development would have resulted in abandonment. Instead both have drilled through the salt, No. 1 Fitzgerald from 2,188-2,567 feet and No. 1-B Barber from 2,257-2,585 feet, and at this writing are drilling in formation.

The Real Discovery

It was not, however, until the completion of Mills Bennett Production Co.'s No. 2 Gulf-Fisher the middle of July that the importance of this new development really was appreciated. That well, located on the southeast side of the dome, far on the inside of the outer edge of the outlined cap rock and salt area. The location was approximately 500 feet closer in that No. 2 Barber, the test previously mentioned as having drilled through 600 feet of cap rock and back into formation and having been abandoned at 6,962 feet. Under previous theories of salt dome development, this location would have been in definitely condemned territory.

The No. 3 E. W. Barber has proved one of the most interesting wells yet drilled at Barbers Hill. In reaching the oil sand at 4,981-5,147 feet in which it was completed for 1,250 bbls. of pipe line oil, it drilled through 352 feet of cap rock and 1,646 feet of salt, the greatest amount of salt ever drilled entirely through. The following log entries were made: Top cap rock, 1,200 feet; top salt, 1,552 feet; bottom of salt, 3,198 feet. Geologically the well is the highest yet drilled at Barbers Hill. It topped the "Big" lime, the Helerostegina zone of the Oligocene, at 4,654 feet, this being approximately 100 feet higher than in any other deep tests. Bottom of the lime was 4,738 feet. The latter is attributed to the fact that the well is higher on the main salt plug than other wells which have been drilled off the ledge and consequently farther away from the central core. Mills Bennett Production Co. owns all acreage for some distance around the well.

On the west side of the cap rock area, another well, Sun Oil Co.'s No. 1 Winfree, was completed in a sand found after drilling through a ledge of cap rock at 3,939-4,751 feet. This well flowed an estimated 1,200 bbls. at 5,328 feet. In addition to Humphreys Corp.'s No. 1 Fitzgerald, and No. 1-B Barbers, previously mentioned, two other tests, No. 6-A Barber, northwest side, and No. 8-B Kirby on the northeast, now are drilling in formation after having passed through cap rock. The former encountered salt at 3,559-4,146 feet, and the latter at 1,782-2,535 feet.

Follow Up Discovery

That the formation of many others, if not all, domes, was similar to that of Barbers Hill and that similar conditions exist is the belief of some operators, and

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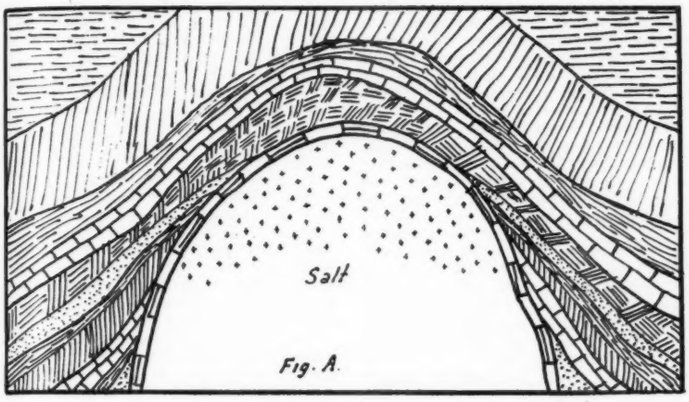
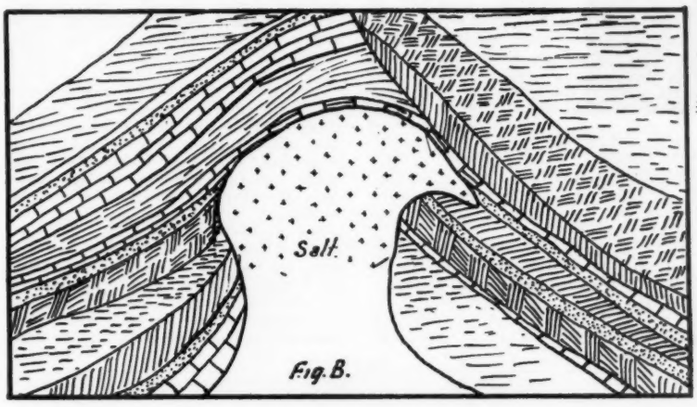
Interesting Tests

In view of what was learned by the Fisher well Mills Bennett Production Co. immediately made location on the north side for No. 3 E. W. Barber, a location drilled through 483 feet of cap rock and 256 feet of salt at 1,694-2,433 feet and in an underlying oil sand at a total depth of 4,769 feet was brought in flowing under chokes better than 2,000 bbls. daily of pipe line oil. Since completion the well has maintained one of the most consistent flows of any well yet completed at Barbers Hill and still has failed to show any water. By reason of topping the sand higher up on the flank of the main salt mass underlying the ledge of salt it is the shallowest of the deep wells in that sector.



General conception of a salt dome as a mound shaped mass or hill of salt.



This is a possible shape of any Gulf Coast salt dome as indicated at Barbers Hill and Allen where thick ledges of cap rock and salt rock have been drilled through in recent months. This is not intended as a true picture of the Barbers Hill, Allen or any other particular dome but is an exaggerated representation of what may be expected of a salt dome, showing the possibilities of prolific production under the ledges.

MANY ORDERS FOR EQUIPMENT COME AS RESULT OF BIG PETROLEUM SHOW

By Thomas F. Smiley

More men were actuated by serious business considerations in attending the Seventh International Petroleum Exposition, Tulsa, which closed last Saturday night, than in any previous year, according to representatives of equipment manufacturers in charge of exhibits during the eight days of the show. A greater number of earnest, intelligent questions were asked. There were fewer manifestations of idle curiosity. Most important of all, the volume and value of actual orders for equipment as a result of the show are said to have exceeded those of other years.

It is pointed out that the entire amount of business growing out of the exposition cannot be gauged, as in many cases interest excited by demonstrations of machinery at the exposition may not be translated into orders for many weeks. Practical results of the show were seen not only in sales made during the exposition, but in orders by telegraph and mail that began coming in large volume following the close of the show. Many of these orders were reported Monday of this week. One man who had not indicated in any way what he had decided to do while he was at the grounds inspecting the various displays wired from St. Louis, Mo., an order for $80,000 worth of engines.

In this connection W. G. Skelly, president of the exposition and president of the Skelly Oil Co., said:

"The oil industry has been traveling a rough road. It is realized by producers, refiners and marketers alike that to keep out of the red they must adopt the most efficient and economical equipment and methods. As a result of this realization this year's exposition was attended by an unusually large number of presidents, general managers, superintendents and other executives, who were moved by the necessity of making a more searching study than ever before of the details of their business. They were looking for better tools and better ways of doing things. When potential buyers come to the exposition in that mood the manufacturers are bound to do business with them."

Mr. Skelly said the receipts from the show equaled the expectations of the directors, notwithstanding three days of rain and that the exposition would close its fiscal year without a deficit.

Exhibitors Express Satisfaction

Exhibitors were virtually unanimous in their expressions of satisfaction over the 1930 show. The best evidence that they had found the exposition a profitable thing for themselves is provided in the fact that by Monday evening of the present week more than 100 of them had

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Mud Problem Now Receives Attention

Rotary Drilling Requires Prepared Mud-Laden Fluids and Engineers Are Devoting Time to Study of Conditions

By L. G. E. Bignell
Petroleum Engineering Editor

The interest of the production engineers and field men engaged in drilling rotary wells is rapidly being concentrated upon the problems of preparing suitable mud fluids for their work that can be used for all conditions found while drilling a rotary hole. This is not really a new problem for A. G. Heggem and J. A. Pollard prepared a bulletin for the United States Bureau of Mines in 1914 entitled, "Drilling Wells in Oklahoma by the Mud-Laden Fluid Method." It is true that this applied to cable tool wells, but the mud problem was there, nevertheless.

John R. Suman also deals with some mud problems in rotary drilling in his book, "Petroleum Production Methods," published several years ago, and H. C. George, now professor of petroleum engineering at University of Oklahoma. Norman, Okla., did some interesting work with mud fluids in the Healdton Field, Oklahoma, a good many years ago while he was with the United States Bureau of Mines.

These men and others have pioneered in this problem when the use of rotary outfits was somewhat limited, but now that they are almost universally used and the wells are being drilled to depths of more than 6,000 feet the mud problems are taking on an importance that at this time is comparable with the crooked hole problem in drilling as it was two or three years ago.

Several very excellent papers have been presented at meetings of the A.P.I. and A.I.M.E. within the past six months and articles have been published in The Oil and Gas Journal dealing with this subject from several angles.

In this issue there are four articles on problems allied to rotary mud fluids which will add much to the present literature and the paper by C. C. Parsons of the Halliburton Oil Well Cementing Co., Duncan, Okla., is a pioneer of its type dealing with the colloidal chemistry of mud and its admixtures, and bringing to the attention of the industry many new phases of this problem that will bear considerable research work.

Admixtures Now Necessary

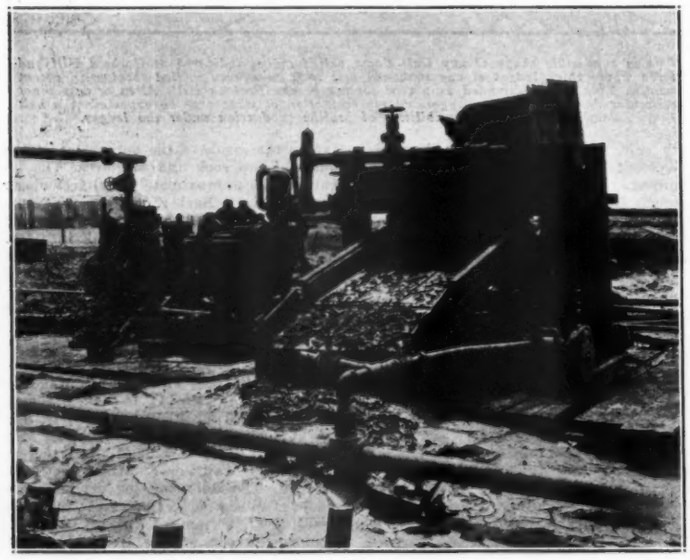
When wells were drilled with the rotary a few years ago, the depth to which they penetrated and the type of formations passed through were of such character that good mud making material was taken from the hole and when mixed with the drilling water made a fairly satisfactory mud.

The driller did not find any occasion to use weighting materials with his natural mud for the depths of the wells were not sufficient to bring about pressures that were greater than the hydrostatic column set up by the weight of the natural mud except in a few instances.

But as the wells have been deepened and the rotary equipment improved and made heavier, the formations now being penetrated at great depths are not of a character that make good mud, and it is therefore quite essential that some type of admixture be added to the mud to give it certain qualities needed in the hole. It is also quite a common practice to purchase mud-making materials as the formations will not yield suitable cuttings to make rotary mud.

With the introduction of weighting materials in mud to prevent blowouts, and the purchase of other admixtures for making the mud suitable to the well requirements and the actual buying of clays from which to make muds, the situation in the drilling operations in most fields has materially changed, and the expense of these materials is such as to make it quite necessary that as much of the mud as possible be reclaimed for further use.

In the fields of Oklahoma many different kinds of clays and admixtures have been sold at prices ranging from $10 to $50 per ton and used in quantities ranging from 8 to 10 tons to 200 or 300 tons per well. In extreme cases much more mud has been used, and in the Hobbs, N. Mex. Field it is common practice to use from 100 to 300 tons of mud material in the well that will range in price from $7 to $35 per ton. It has been estimated that the average cost of mud for Hobbs wells is about $10,000.



Vibrating screen in Hobbs Field, New Mexico, reclaiming mud from slush pit for use in drilling new wells.

In California, mud is one of the principal items of expense in drilling wells, and the operators there were quick to recognize the advantages of treating their muds in central plants.

Mud-Treating Equipment

One of the uses for mud in rotary drilling is to act as a carrying medium to remove the cuttings from the bottom of the hole to the surface and then to drop these cuttings so that the mud will again be free of any appreciable amount of foreign particles.

The use of slush pits, ditches and launders to settle cuttings out of mud has long been practiced, and where the wells were making an excess of mud from the well borings it was possible to discard a portion of the mud that had settled to the bottom of the slush pit and in so doing remove the settled cuttings also. The usual method used in clearing the pit of these bottom settlings was steam jetting and the mud carried along with the cuttings was easily made up out of the material removed in making the new hole.

This method could be followed, and in fact was followed, largely in the Oklahoma City Pool, but where expensive material has been added to the rotary mud part of this admixture will be lost when the cuttings are jetted from the slush pits.

When the hole is completed it is customary to move the rotary equipment on to another location, but all mud is left at the well in the slush and reserve pits. This is detrimental in two ways, the material left has cost the production company money, and leaving a mass of cuttings and mud around the well deteriorates the value of the land if it is to be later used for farming purposes.

In California this latter phase of the problem predominated, and to protect themselves against costly law suits started by owners of orange and lemon groves and other landowners adjacent to the drilling wells, the producing companies have been very careful to control all mud handled from drilling wells.

Screening Out Cuttings

Problems of handling rotary mud are comparable with those that are common to ore dressing where ore has to be crushed, screened and classified for treatment by various methods that will separate the mineral portions from the gangue.

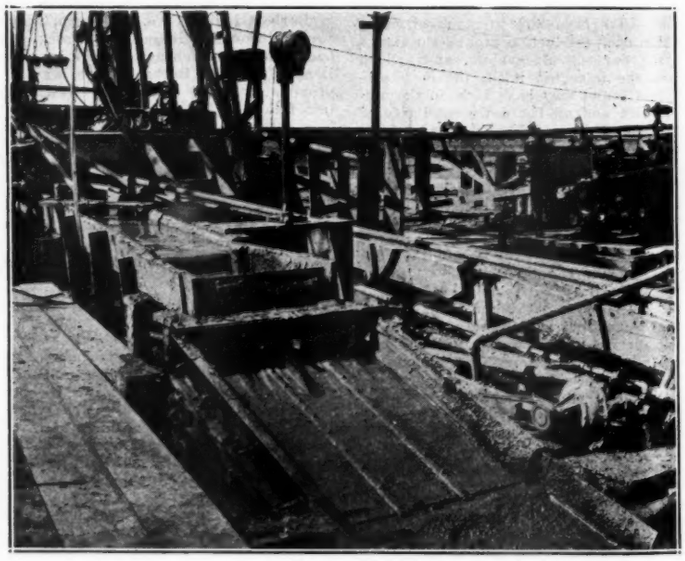
Screens have long been used in ore dressings and the petroleum industry can well turn to the manufacturers of screens that have been used in ore mills and in other industries for a solution of part of their mud-handling problems.

In California they have been using vibrating screens for removing cuttings from rotary mud for some time, and it is understood that over 15 of these screens are now in actual use and more being ordered.

In the Oklahoma City Pool a type of screen known as a "shale separator" was in common use. It consisted of a number of screen-bottom trays mounted upon two parallel endless-link chain belts that ran over double sprockets at each end of the machine and carried the material that remained on top of the screen in each tray to the end of the traveling belt and dumped it. It is driven by a steam turbine or an electric motor, as desired.

Screens are making their appearance in the Gulf Coast Field, and there has been some experimenting with them in Michigan.

It is also understood that in the Rumanian oil fields they have central mud-mixing plants and are going to the use of screens to remove the cuttings at the well, and in this way lower their costs, because it will make the mud suitable for use for a longer period of time. This will save cost in transportation of mud by pumping through the pipe-line system laid from the central plant to the individual wells, for without screens they were wasting mud to get rid of accumulated cuttings from the well.



Vibrating screen at a well in Hobbs Field, New Mexico, removing cuttings from rotary mud.

The problem is common to every rotary field and all muds, whether made from the well cuttings or from clays bought for mud purposes, and the use of vibrating screens is gaining favor rapidly, and they are paying for themselves in a short time wherever installed.

Used in Hobbs, N. Mex.

In the Hobbs, N. Mex., Field several companies have been quick to avail themselves of the advantages to be gained by

(Continued on Page 108)

Natural Gas Industry in United States

Comprehensive Review of the Operations and Present Condition of the Industry. Latest Developments

By Robert W. Hendee
Vice President, Oklahoma Natural Gas Corp.*

The nationwide use of natural gas and the growth of the industry has sprung up from a mere infant a few years ago to one of the major industries of today. Only a short time ago, it was deemed an engineering and an economic impossibility to lay a natural gas transmission line of over 100 miles. But in the past few years the distance natural gas has been transported has increased from 100 miles to 350 to 500 to 800 and now to 1,000 miles, and what will the limit be? As long as the market, a suitable reserve and necessary finances are at hand, engineers will provide the needed pipe line and compressor station link between the field and the market. It does not seem unreasonable to expect, providing the tremendous fields continue to be developed in the Mid-Continent areas, that the near future will see huge transmission systems extending practically across the continent and linking one system with another for standby service, similar to that now maintained by the power companies.

The discovery and use of natural gas seems analogous with the movement of the pioneers of our country who first located in the East, then moved on to Ohio, Indiana, Kentucky, Tennessee and Illinois and thence to the West Coast. So it was with the discovery and use of natural gas which was found and developed first in the East and then on across the continent.

Production and Consumption

Before going into a history of the gas fields, it might be of interest to give a few facts which have appeared in those admirable Bureau of Mines publications by G. R. Hopkins and H. Backus, giving the statistics of natural gas year by year, which have shown the relation of the production and consumption of this fuel.

The amount of natural gas consumed in the United States has increased from 300,000,000,000 feet in 1906 to approximately 1,800,000,000,000 feet in 1929. This is even an increase of 15 per cent over 1928. Five states accounted for 80 per cent of this amount of gas, which were, in the order of their importance, Oklahoma, Texas, California, Louisiana and West Virginia.

Of the 1928 consumption, which was, according to the lastest bulletin 1,567,979,000,000 feet, 36.6 per cent was used under boilers in the oil fields and 7.3 per cent for fuel at petroleum refineries, making practically 44 per cent of the total consumption in oil and gas operations. Manufacturing and industrial plants took 19.5 per cent of the total, 4.9 per cent was consumed in the generation of electrical power and 11.2 per cent was utilized in the manufacture of carbon black. Thus, a total of 79.5 per cent was used industrially and the remaining 20.5 per cent reached the domestic consumer.

But this tremendous production of natural gas means that there is just that much less for succeeding generations. With such fields as now exist and with the enormous quantities of gas available we must not for a moment slacken our efforts towards conservation and the elimination of waste. It is to be hoped that the many measures looking towards the conservation of this matchless fuel will not be put aside just because of such statements as, "four Texas areas alone, without drawing upon the supply of any other state, are adequate to supply the total requirements of the United States for at least four years." That is a lot of gas, but four years is not a long time. As conservation measures I might cite the Louisiana law which limits the withdrawals from any well in proportion to the acreage upon which it is drilled; the Oklahoma Corporation Commission's ruling allowing quarterly instead of monthly open flow tests and favoring closed-pressure methods; the California conservation law which limits the production of gas and oil to the amount of lifting gas which can be used; and to the unitization plan for drilling, now being tried and advocated by many.

Story of the Industry

Although nearly everyone knows of the earliest discoveries of natural gas the history of a large industry always is of interest and does not seem amiss in this article.

There seems to be a little discussion as to whether natural gas, then regarded as dangerous and an act of Satan, was first noticed in the United States at Fredonia, N. Y., or on the eastern banks of the Ohio River, near what is now Pittsburgh, or somewhere in Ohio, where wells were being drilled for salt. But regardless of this, everyone is agreed that the first well actually drilled for natural gas was near the town of Fredonia, N. Y. This well, only 27 feet deep, was drilled in 1821, in the banks of a stream. And the first use of this product of nature as a source for light in residences was in the same town in 1824.

A little later, in 1840, the first gas well in the State of Pennsylvania was drilled near New Castle.

It was only a short time after this that the natural gas industry as such had its inception with the formation, in 1865, of the Fredonia Gas, Light & Water Works Co., organized for the purpose of distributing gas for domestic purposes.

The first attempts at long distance transmission of natural gas were mostly failures, as for example, the line finally completed and then abandoned by the Bloomfield & Rochester Natural Gas Light Co. This was a wooden line of bell and spigot construction 25 miles long. The joints were random lengths of selected pine, turned and bored to the necessary inside and outside dimensions. The stories of modern steel line hardships through swamps and over mountains read like fairy tales in comparison with the trials and tribulations experienced in that construction job. Recently, a wooden pipe line of the above type of construction was removed from the streets of Marietta, Ohio, after having been in the ground for 73 years.

The first long distance cast iron gas line was one of 2 inches in diameter, extending from the Newton well to Titusville, Pa. This line was all of 5 miles long and was completed in 1872.

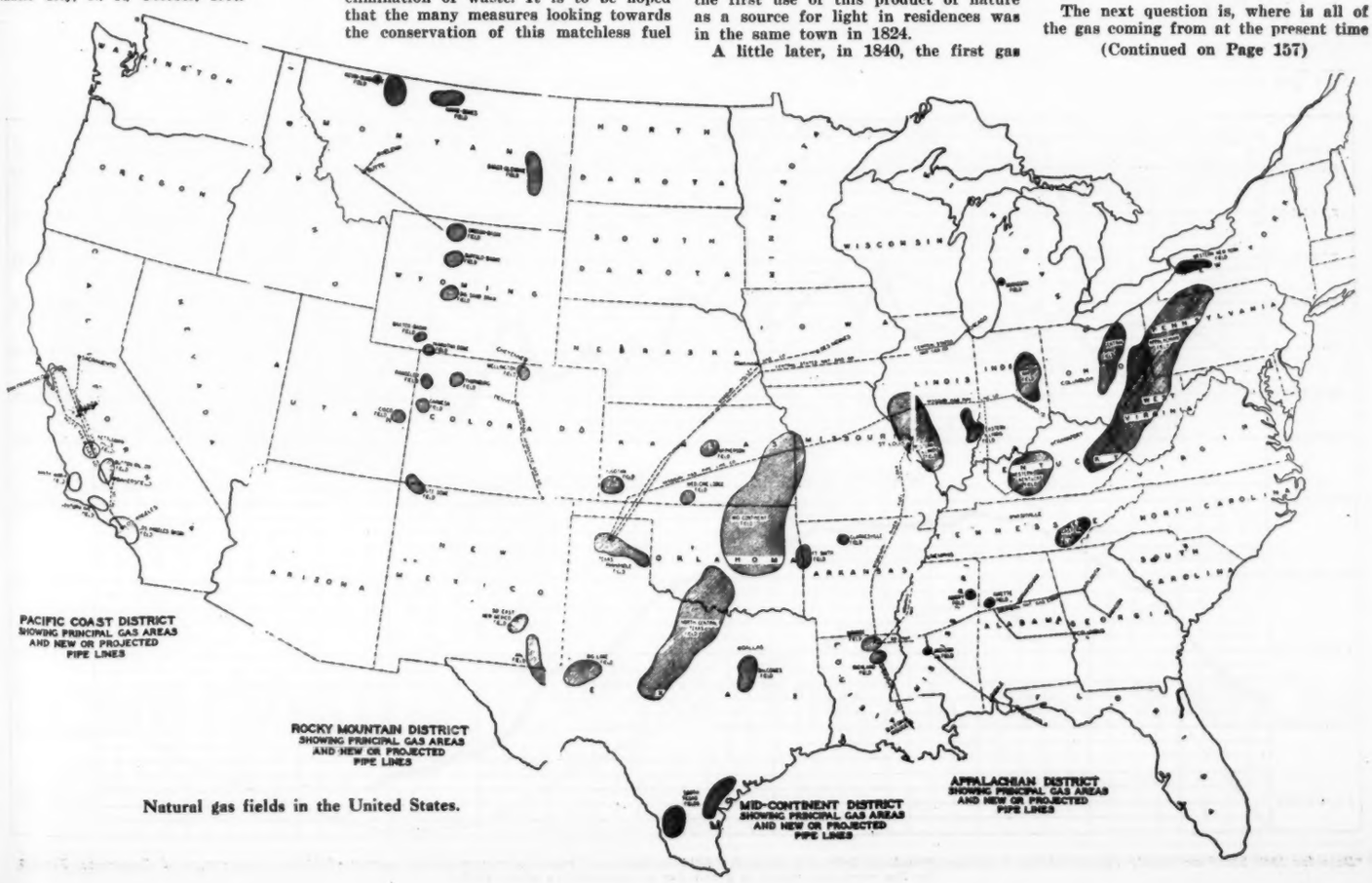
From that time to this day, many strides have been taken and at this time, there are nearly 80,000 miles of natural gas lines in this country. The total investment in pipe lines is $2,000,000,000 with another $250,000,000 to be added during 1930.

Gas Fields

The next question is, where is all of the gas coming from at the present time

(Continued on Page 157)

*Before American Gas Association, Atlantic City, N. J., October, 1930.


PACIFIC COAST DISTRICT
SHOWING PRINCIPAL GAS AREAS AND NEW OR PROJECTED PIPE LINES
ROCKY MOUNTAIN DISTRICT
SHOWING PRINCIPAL GAS AREAS AND NEW OR PROJECTED PIPE LINES
MID-CONTINENT DISTRICT
SHOWING PRINCIPAL GAS AREAS AND NEW OR PROJECTED PIPE LINES
APPALACHIAN DISTRICT
SHOWING PRINCIPAL GAS AREAS AND NEW OR PROJECTED PIPE LINES

Natural gas fields in the United States.

Narrower Market Spreads In Future

Expansion of Station Operation to Include Tire and Other Services May Bring Important Changes in Sales Policies

By C. O. Willson

The expansion of services and the selling of commodities other than petroleum products at filling stations is to result in the permanent narrowing of marketing spreads, according to the views expressed the past week by representative executives and sales managers.

These predictions, following the recent declines in gasoline tank wagon and service station prices and similar reductions in kerosene wholesale prices over a large part of the consuming territory, were made with the knowledge that similar prophecies in recent years have not been borne out by later developments. The rule in the past has been that short periods of narrow margins in marketing were gradually widened until they became top heavy and were reduced, thus starting again the cycle which has brought wide dissatisfaction among buyers and sellers and misunderstanding at times on the part of the consuming public.

Despite the failure of previous forecasts, many market students see in the developments of the past few months a fundamental change in marketing policies having as its aim the elimination of excessive operating expenditures which have been responsible for the heavy costs incidental to the sale of gasoline, kerosene, lubricating oils and greases after these products have been delivered from the refinery to the point of consumption.

Cause of Change

Everyone connected with the refining and distribution of petroleum products is familiar with conditions which have made some change in oil merchandizing methods mandatory. In general, both large and small companies have rapidly expanded market facilities, the trend being to emphasize the importance of company-owned drive-in filling stations located along streets and highways having the greatest motor vehicle traffic. In addition to their own stations, many companies have used various means to increase the number and size of their independent dealer accounts.

The net result of this trend has been a constantly mounting investment in distributing facilities. The investments in real estate on which the stations are located whether purchased or leased by the oil companies have increased. The cost of improvements on this real estate due to the demand for elaborate station facilities has mounted from a few hundred dollars to several thousand dollars per unit.

As explained by one operator, a covered greasing "palace," "lubitorium," etc., now costs more than the complete station of a few years ago. These stations whether company or dealer-owned have rapidly gained in number as have curb pumps and other equipment at garages and similar distributing units.

On the operating end, more labor has been required due to a competitive situation which has stressed service as well as elaborate facilities. The number of attendants at many stations has increased from 50 to 100 per cent.

With rare exceptions, this greater investment and higher operating costs have not been offset with a compensating increase in volume of business. In fact, in many of the large consuming areas, the gallonage per station has shown a steady decline as additional units were added despite the strenuous efforts made to bring about the reverse situation.

The inevitable result of this situation was the wider spread per gallon of finished products sold to cover the increased cost of distribution. Individual companies found that 5 or more cents per gallon was required in the case of gasoline to cover the actual cost of bulk and service station operation. In one form or another wider margins have been allowed dealer accounts so that the same condition obtained there as in the case of company stations. In the case of jobbers buying on a tank car basis, the margin between the delivered gasoline price and the prevailing service station price minus tax during the past few months has generally exceeded the refinery quotation. In other words, as was pointed out by one refinery manager, the cost of market-

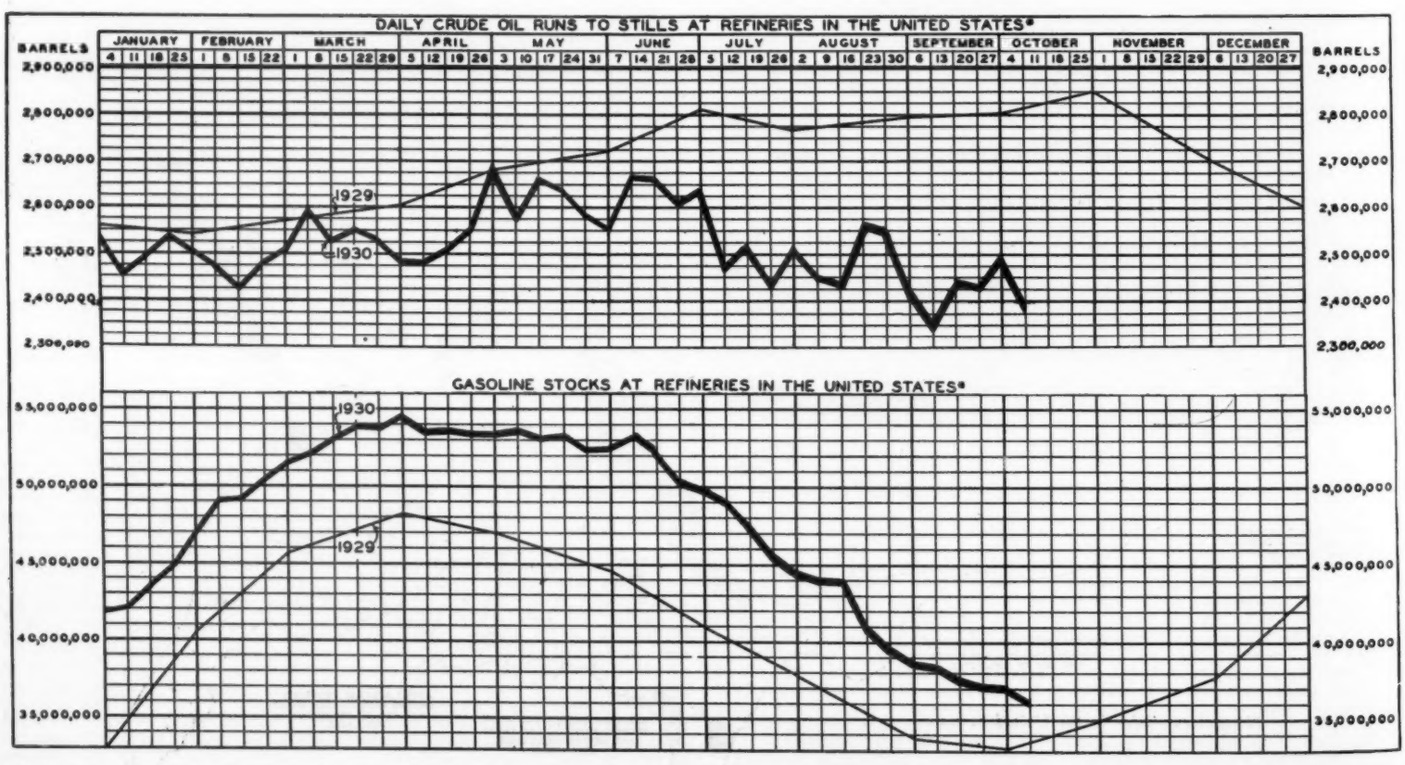
(Continued on Page 138)

AMERICAN PETROLEUM INSTITUTE WEEKLY REFINERY STATISTICS

The weekly report made to the American Petroleum Institute on refinery statistics—crude runs to stills, gasoline stocks and gas and fuel oil stocks in barrels—for the week ending October 11.

	Week ending October 11				Week ending October 4				Week ending January 4			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
East Coast	100.0	493,900	5,364,000	11,813,000	100.0	499,600	5,182,000	11,774,000	100.0	454,857	5,998,000	7,431,000
Appalachian	93.6	73,700	966,000	1,026,000	87.5	74,100	980,000	1,075,000	91.6	75,571	1,282,000	865,000
Indiana, Illinois, Kentucky	97.5	271,400	5,398,000	4,177,000	97.5	285,800	5,497,000	4,339,000	98.6	289,800	5,483,000	3,505,000
Oklahoma, Kansas, Missouri	89.4	267,300	2,460,000	4,771,000	89.4	257,600	2,435,000	4,821,000	87.7	263,428	3,604,000	3,277,000
Texas	91.9	570,600	6,107,000	10,275,000	91.9	533,400	5,616,000	10,480,000	90.7	539,857	6,590,000	13,757,000
Louisiana and Arkansas	98.3	149,100	1,178,000	2,145,000	98.3	160,600	1,132,000	2,153,000	96.8	160,000	2,161,000	4,499,000
Rocky Mountain	93.1	46,800	1,725,000	1,116,000	93.1	48,000	1,794,000	1,182,000	93.3	41,614	2,273,000	973,000
California	98.3	497,600	13,927,000	104,134,000	98.3	532,600	13,805,000	104,627,000	99.3	642,857	14,826,000	109,770,000
Total United States	95.6	2,371,000	37,125,000	139,457,000	95.4	2,391,700	36,441,000	140,451,000	95.4	2,468,285	42,217,000	144,017,000
Texas Gulf Coast	100.0	442,900	4,958,000	7,459,000	100.0	415,900	4,459,000	7,627,000	100.0	429,585	5,579,000	10,792,000
Louisiana Gulf Coast	100.0	95,700	956,000	1,378,000	100.0	110,700	894,000	1,410,000	100.0	108,514	1,877,000	3,818,000

(1) Per cent refinery capacity represented. (2) Daily crude runs to stills. (3) Gasoline stocks. (4) Gas and fuel oil stocks.



Data for 1930 based on weekly reports of the American Petroleum Institute. Data for 1929 derived from monthly reports of the Bureau of Mines, Department of Commerce. Figures for last week not shown in graph but are included in above tables.

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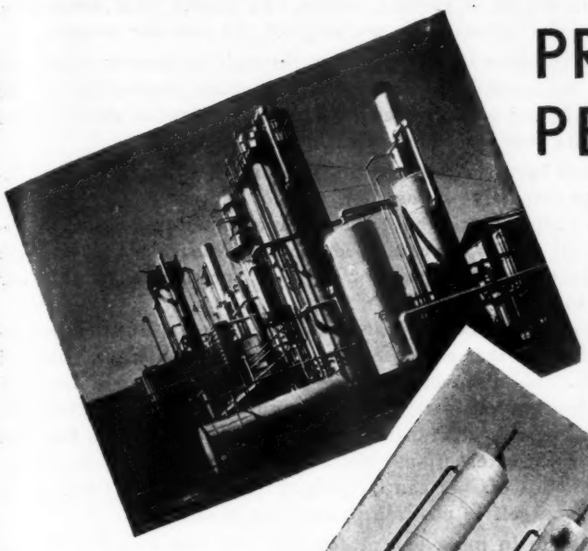

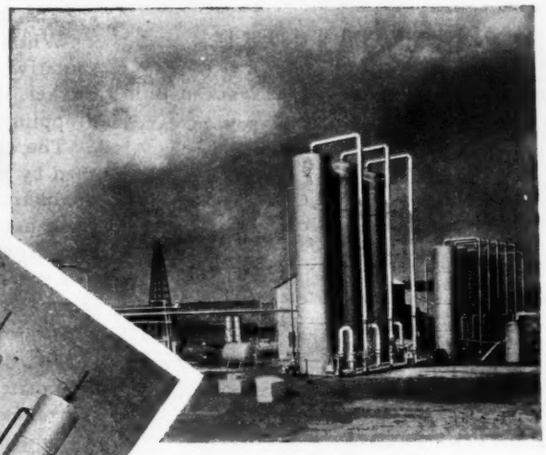

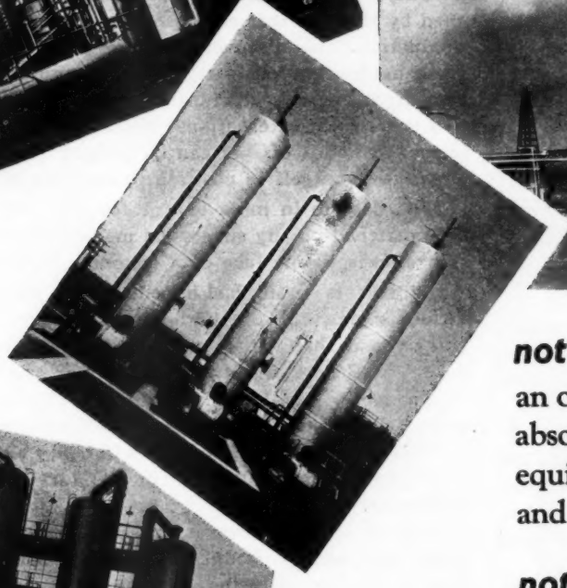

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WHAT MIGHT HAVE HAPPENED

The general breakdown in copper, another basic industry, is a vivid example of what might have happened to the petroleum industry had not co-operation on curtailment of overproduction been put into effect.

Copper at 10½ cents reached the lowest price in 30 years.

Copper companies have been omitting or reducing dividends and the shares of major companies have registered tremendous declines.

Up to about a year ago consumption was equal to or in excess of production. Then the situation was allowed to get out of hand and overproduction resulted.

The price had been stabilized at about 18 cents from April, 1929, to early in 1930, but in April of this year it had been forced downward and later ranged through 12½ to 11 cents.

But not even this smashing reduction within a short six months brought the industry to its senses. Stocks of refined copper had been increasing steadily for nine months until at the end of August this year they were three times what they had been in September, 1929.

Yet a large percentage of the copper now being produced from mines in this country is said to mean a loss with copper at 10½ cents a pound.

A survey by the tariff commission based upon annual reports for 1929 covering the cost of producing 96 per cent of the country's primary output found that one-half was made at a cost of 11 cents or more. The average for the total output was 11.81 against 10.27 cents in 1928.

The copper output has declined in the past four months and smaller production will mean higher cost per pound to many companies, notwithstanding improved production facilities which by lowering cost had enabled some to continue operations during the 11-cent market.

The similarity with reduced production of crude oil and unwieldly stocks of gasoline is marked but the difference in the two industries is the progress being made by the oil industry in solving its difficulties and the apparent lack of leadership and co-operation in the copper industry which is rapidly dropping from bad to worse.

The copper situation was summarized in a Bureau of Mines report which said:

"Production and consumption of copper continued at a high rate throughout 1929, but production so far outdistanced consumption as to cause an accumulation of stocks of refined copper at the end of the year of more than two and one-half times the stocks at the beginning. This condition was followed by recession in both price and buying after the close of the first quarter of 1930."

Notwithstanding, the end of August showed a further notable increase in stocks of refined copper, the largest total since July, 1921, when the industry was working off the post-war surplus.

On the contrary the oil industry, through systematic effort and universal co-operation, had reduced its crude production 500,000 barrels daily and was engaged in a carefully planned movement to cut down its overproduction of refined products.

This had been reflected in the stock market position of the issues of the respective industries.

While copper stocks have shown an astounding collapse representative oil stocks have offered a strong resistance during the market fluctuations, neither soaring to speculative heights nor dropping to panic prices.

The comparison between the two industries is further heightened by the fact that each faced an enormously enlarged potential production. The discovery of new oil fields offering a flood of flush production was met by the inauguration of the curtailment campaign. The copper industry, facing new production in the next two years from International Nickel and the South African mines, seems, so far as effects can be judged, to have made little or no effort to put itself in position to stabilize itself.

The decline in mine output for the past few months has not been matched by any successful movement to cut down the refined stocks, even in the face of a lessening in demand.

Bankers, it is said, had hoped that the low price of copper would influence most of the high-cost producers to close their mines quickly and that with copper at an unprofitable level many producers would prefer not to deplete their ore reserve.

An abnormally low price, the experts believed, would quickly curtail the output and remedy the abnormally high inventories.

This sounds familiar to the oil industry which has had its season of similar argument about letting production run until demand exhausted it.

Copper sellers, however, have learned that "mines die hard." Small independent producers have deferred closing their mines as long as possible believing that the depression would soon end.

The same trend of thought prevailed for a long time in the oil industry, even up to a few years ago, when, finding itself headed for the same condition that the copper industry finds itself in today, the oil industry decided to try the co-operative method.

Had it not been for that movement there is not the least reason to doubt that the oil industry today would be in the same mess as the copper industry.

The contrasted condition of the two industries is a striking justification of the conservation campaign in the oil industry.

The contrast would have been more remarkable had oil men generally taken hold of the co-operative movement earlier but even as it is they have every cause for congratulating themselves upon having adopted it when they did in comparison with the state of the copper men who did not.

Whether judged from the standpoint of production, consumption and stocks, prices or the standing of petroleum securities as an investment, the oil industry is today in a vastly better position than it could possibly have been had there been no conservation movement.

What oil men have accomplished is the more amazing when it is remembered that the conditions, traditions and laws surrounding the production of oil presented peculiar difficulties not found in any other industry. Experience, long established practices, habit of mind, customs crystallized into law, had to be uprooted and discarded before a beginning could be attempted but under energetic and enlightened leadership the whole industry was won over to the new program which has saved the petroleum industry from the hapless state in which the copper industry finds itself today.

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Introduce New Type Vapor Phase Unit

Lubrite Refining Corp. at East St. Louis Refinery Developing Process on Small Equipment. Does Not Produce Coke

By W. T. Ziegenhain

A new type of vapor phase cracking unit, operating under United States Patent letter 1,752,264 issued to C. J. Pratt, has been introduced to the industry at the Lubrite Refining Corp.'s plant in East St. Louis, Ill. The new process was developed there and semicommercial runs have extended over a period of little more than eight months on a small unit. The experimental unit has a capacity of 375 bbls. of 26 gravity topped Mid-Continent crude daily. The features of the process include:

1. Only overhead stocks reach the furnace tubes.
2. The overhead stock is distilled from the heavy charging stock by direct heat exchange within the unit.
3. Only that oil reaches the tubes that has been previously subjected to cracking conditions.
4. The operation is flexible enough to permit running to nonresid.
5. Any normal type of charging stock may be economically handled, including kerosene, gas oil, and fuel.
6. Fuel consumption is relatively low, due to efficient heat exchange.
7. The fuel oil residuum is free of coke to a low degree of concentration.
8. Control is simple and centralized.

Formed Corporation

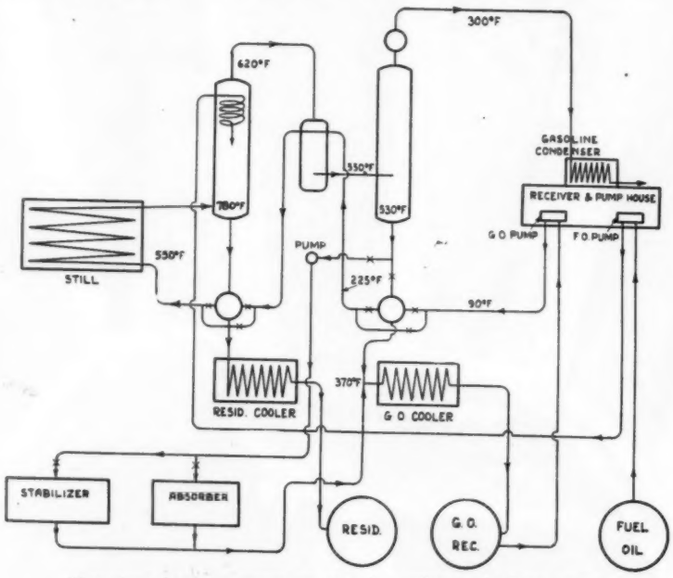
Following the experimental work, the Automotive Distillate Corp. was formed with C. J. Pratt, originator of the process, as president. The use of the process is being offered to refiners under a license agreement, but manufacturing and sales rights for the equipment have been secured by the J. P. Devine Manufacturing Co. The Automotive Distillate Corp. has been organized in Kansas with a capitalization of $2,000,000.

Results of Operation

The yields, quality of products, gas losses and throughput of this process are dependent upon such factors as type of charging stock, degree of cracking, etc., as in the case of all types of cracking units, but as a basis for discussion, the present operation of the experimental unit will be taken.

When charging 375 bbls. per day of 26 gravity topped Mid-Continent crude and running to a 14 gravity fuel resid, 42 per cent of motor fuel is made; when blended in equal proportions with average Mid-Continent straightrun gasoline, produces a gasoline having approximately 40 per cent benzol equivalent.

Operating as stated above, approximately 80 per cent liquid products are recovered direct from the unit. This includes the 42 per cent 425 endpoint blending stock, and 38 per cent fuel residuum. The remaining 20 per cent is gas and loss. This gas contains 3 gallons of recoverable gasoline per 1,000 feet and is processed through a conventional recovery system.



Flow chart showing temperatures at various points in the Pratt process.

Description of Equipment

Only a brief description will be made of the equipment comprising the present unit. The essential feature of the unit from the equipment standpoint is that it does not include a cracking chamber. Vaporization in the tubes apparently eliminates this need.

By referring to the accompanying flow chart, the essential parts of the complete unit may be seen to include the furnace, evaporator, bubble tower, and gas separator. The gas recovery system may or may not be made a part of the unit, although it will probably prove economical to include it in most cases.

The furnace is comparatively small, containing but seventy-two 3-inch O.D., 2½-inch I.D. steel tubes and forty-six 2½-inch O.D., 2-inch I.D. chromium steel tubes 11 feet long. The evaporator is 4½ feet in diameter and 30 feet high and contains a closed coil in the top, and a closed coil in the midsection with mist extractors between these coils. The fractionating tower is 5 feet in diameter and 35 feet high and contains 12 bubble cap trays.

Method of Operation

The operation of the process might be followed best by again referring to the flow chart. The fuel oil, which is maintained at approximately 120° F. is charged to the unit by first pumping it through sets of closed coils in the evaporator, connected in series. The top coil serves to preheat the incoming fuel and also cools the area in the top of the evaporator so as to knock back the heavier ends and in effect, relieves the fractionating tower of a portion of this duty. The partially heated fuel then passes down through the second coil which is located in the midsection of the tower, where it is further preheated. The end of the coil is so located as to cause the stream of incoming fuel oil to fall on the stream of hot oil coming from the still.

The temperature in the top of the evaporator is maintained at about 620° F. which permits a rather heavy gas oil to be taken overhead along with the cracked motor fuel and gases. The mixture then goes to a special type of vapor heat exchanger where part of its heat is given up to gas oil going to the still. This mixture then enters the fractionating tower at about 550° F. where complete separation of the motor fuel and the heavier fractions takes place. The reflux condenser on top of this tower is controlled so as to maintain a temperature of about 300° F. at the vapor outlet. This may be adjusted to make any normal endpoint product and is usually held to make a distillate of 425 endpoint. This distillate meets all distillation requirements for blending with refinery gasoline. A simple method of treating and degumming the vapor phase distillate has been developed.

The heavier fractions condense and drop to the bottom section of the bubble tower. They are continuously withdrawn and it is this material that serves as the charging stock for the still. This is a 26-28 gravity gas oil and is continuously withdrawn and run through an exchanger where it gives up a greater portion of its heat to gas oil going to the still.

The temperature of hot oil is further reduced by passing it through a cooling box from which it is run to the gas oil receiver. This is a small accumulator tank and acts as the supply tank for the oil going to the still.

The accompanying flow chart shows an optional arrangement for withdrawing bottoms from the fractionating tower.

(Continued on Page 109)

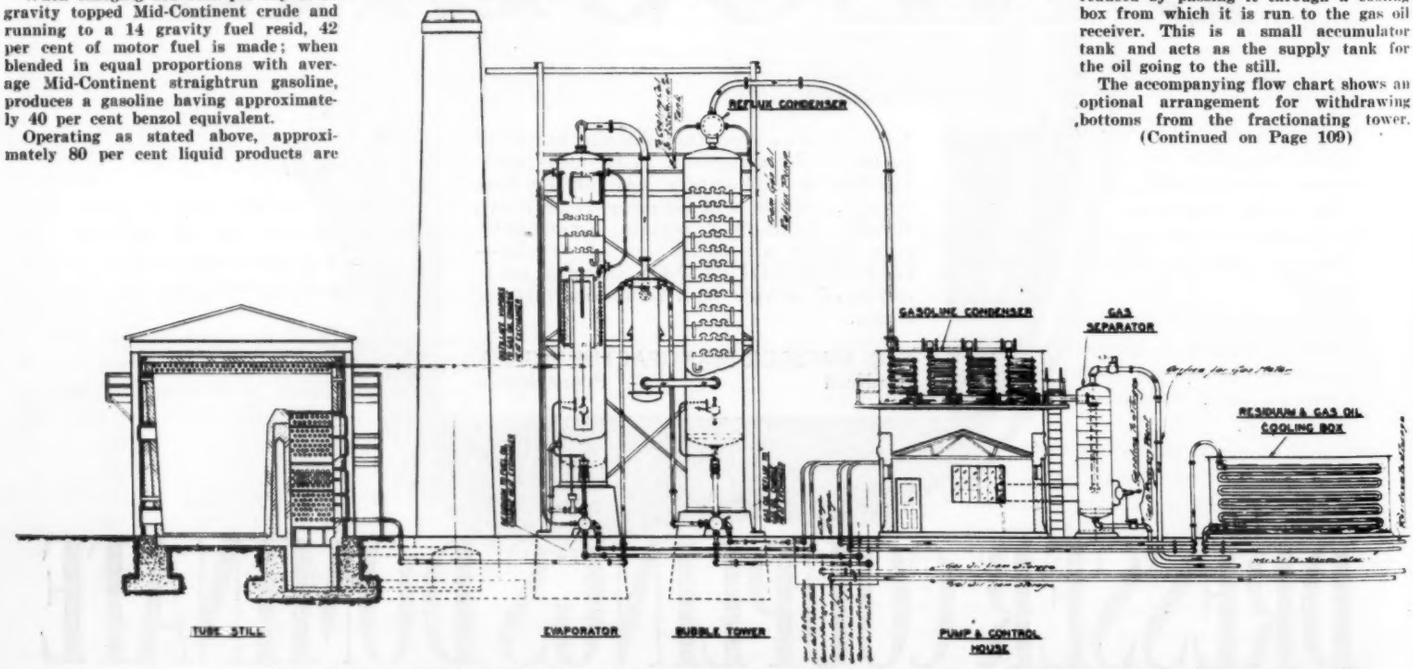
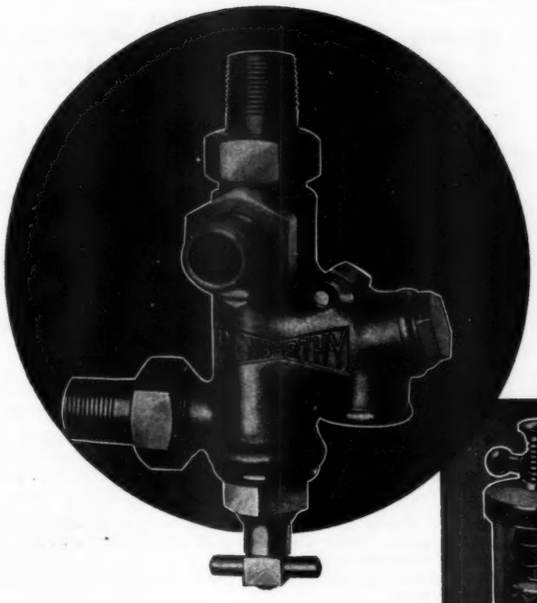
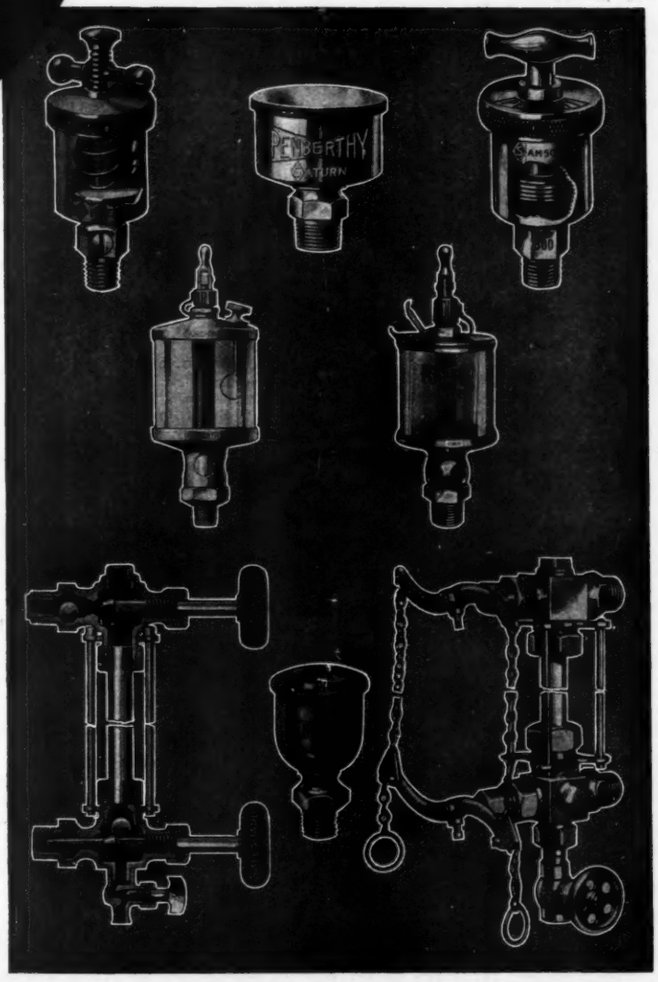


Chart showing arrangement of equipment and direction of oil flow in Pratt cracking process, at Lubrite Refining Corp.



ECONOMY SUGGESTS

PENBERTHY PRODUCTS



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Constitutionality Of Proration Is Upheld by Court

OKLAHOMA CITY, Okla., Oct. 14.—The Supreme Court of Oklahoma today rendered a decision in favor of the Oklahoma Corporation Commission in the case of the C. C. Julian Oil & Royalties Co. against the Corporation Commission in which the Julian company sought to prohibit the commission from interfering with the Julian company in the production of its wells in the Oklahoma City Field.

In its decision, written by Justice Green and concurred in by all but Judges Riley and Cullison, the court said in part: "Under the police power of the State the legislature may regulate and restrict the use and enjoyment of landowners of the natural resources of the State such as oil. Surface owners of the land have the right to drill for and reduce to possession the oil and gas beneath, but this right is to all of the owners alike and when numerous surface owners seek to produce from a common pool it is within the power of the State in keeping with due process of law to require the several surface owners to produce the same under reasonable regulations to the end that some of the owners may not take from the common source more than their equitable share."

OIL MAN'S CALENDAR

OCTOBER

13-16—El Paso, Tex., Regional meeting, A.I.M.E., and Western Division, American Mining Congress.

13-17—Atlantic City, N. J., American Gas Association, Auditorium.

14—Louisville, Ky., Kentucky Petroleum Marketers Association, Seelbach Hotel.

14-16—Kansas City, Mo., Convention. Big Four State Jobbers.

15—Madison, Wis., Wisconsin Petroleum Association.

16-17—Charlottesville, Va., Virginia Oil Men's Association.

16-25—London, England, Olympia Motor Show.

17—Los Angeles, Calif., Pacific Coast meeting, Petroleum Division, A.I.M.E.

20-22—St. Louis, Mo., Petroleum Refiners division, National Association of Credit Men.

21-22—Chicago, Oil and Gas Well Supply Traffic Association, Palmer House.

22-24—Pittsburgh, Pa., transportation meeting, Society of Automotive Engineers.

23-24—Mineral Wells, Tex., convention, Texas Petroleum Marketers Association.

24—Niagara Falls, Ontario, Convention, Natural Gas and Petroleum Association of Canada.

24-25—State College, Pa., Oil and Gas Conference, Penn State School of Mineral Industries.

27—San Antonio, Texas, Independent Petroleum Association of Texas.

29-31—Lawrenceville, Kans., celebration twenty-fifth anniversary, Lawrence County Oil Industry.

NOVEMBER

2-5—St. Louis, Mo., Marketing Congress, Independent Oil Men of America, Statler Hotel.

6-11—Berlin, Germany, International Automobile Show.

10-13—Chicago, eleventh annual meeting, American Petroleum Institute, Stevens Hotel.

13-14—Chicago, American Oil Chemist's Society, Congress Hall.

DECEMBER

1-5—Memphis, Tenn., ninth annual Asphalt Paving Conference, the Asphalt Institute and Association of Asphalt Paving Technologists.

2-4—Omaha, Neb., convention, Nebraska Independent Oil Men's Association, Paxton Hotel.

8—New Orleans, La., American Institute of Chemical Engineers.

JANUARY

3-10—New York, National Automobile Show.

24-31—Chicago, National Automobile Show.

FEBRUARY

16-21—San Francisco, Calif., National Western Metal Congress and Exposition.

OIL TRADE JOURNALS VERSUS POSTOFFICE

Ernie L. Bell, the genial secretary of the Drumright chapter of the American Petroleum Institute, has called the next meeting of the chapter for October 21, 7:30 p. m. in the Community Hall at Drumright, Okla.

Mr. Bell wishes to try the power of the press to bring out his members and guests and is not sending out the usual individual notices. It will be interesting to learn the result of his experiment. So if you see this and attend the meeting it will score one for publicity as attained through the trade journal.

The evening will be devoted to a paper by A. C. (Doc) Frampton on an oil, gas and water separator that fits on the bottom of a string of tubing in the well. What this separator is supposed to do will be divulged at the meeting and after Mr. Frampton "has had his fling" the members will hold an "Experience Meeting" covering their visits to the International Petroleum Exposition in Tulsa, but it is not expected that they will tell all that they did while away from home.

WELD COUNTY, COLORADO, HAS IMPORTANT WELL

DENVER, Colo., Oct. 14.—An important discovery has been made in the Platte Valley Petroleum Co.'s No. 1 Patterson, SW SW, Section 24-6n-61, on the Greasewood Dome in Weld County, Colorado, when the well came in blowing oil more than 100 feet over the top. It then subsided and has been flowing by heads at intervals of three hours, each head lasting from 15 to 20 minutes. The pay was found at 6,642 feet just above the Muddy sand of the Dakota series, the producing horizon at Fort Collins. Officials say the sand has not yet been entered and that 20 feet of additional depth will be necessary to reach that horizon. The oil is a good grade of green paraffin base crude running between 40° and 44° gravity. It makes about 30 bbls. at each head.

Dean E. Winchester, Denver geologist, who was at the well, said the head at 1:30 o'clock Sunday afternoon lasted 22 minutes and threw oil 100 feet beyond the end of 4-inch pipe. Numerous oil scouts are watching the well and considerable leasing is taking place. Location is 50 miles southeast of Fort Collins Field, the nearest producing pool and 60 miles northeast of Denver. The discovery is the first made out from the Front Mountain Range in Denver Basin and undoubtedly will result in extensive wildcatting in eastern Colorado where major companies have been acquiring long-term leases on the basis of regional geology. Continental Oil Co. is co-operating with the operating company and has a crew on the ground building storage.

CHAMPLIN REDUCES PRICES

Effective at 7 a.m. October 13, the Champlin Refining Co. reduced the posted price of crude it purchases in the Mid-Continent area, establishing the new prices of 25 cents to 31 cents below the previous postings. The company has established a price of 90 cents per barrel for oil of 32 to 32.9 gravity with a 3-cent differential up to and including 44 gravity and above which is now $1.26. Under the company's previous schedule and under the Prairie Oil & Gas Co.'s present schedule, the price of 32 to 32.9 gravity oil was $1.15 and a 3½-cent differential was observed, making the 44 gravity oil $1.57 per barrel.

The company is said to purchase about 8,000 bbls. of oil per day and this oil, together with 3,000 bbls. of its own production, is run in the company's refinery in Enid, Okla. The bulk of the purchased oil is being taken from Logan County, Oklahoma, but the company recently completed a 6-inch line into the Oklahoma City Pool and the posting of lower prices will affect any oil moved through this line now.

High Spots in Field News

NEW MEXICO

Regauge at Hobbs shows increases.

SOUTHWEST TEXAS

New pool in Duval County has another test.

EAST CENTRAL TEXAS

Joiner's No. 1 Bradford, Rusk County, flows 363 bbls. in 15 hours.

NORTH LOUISIANA-ARKANSAS

Zwolle extended by its best well. Surprise in Pine Island district.

GULF COAST

Prospects for subsalt production in Barbers Hill disclosed by another good well. Renewed interest at Refugio.

CALIFORNIA

Temblor production proved in North Belridge well; most important discovery in California since Kettleman Hills.

COLORADO

Well on Greasewood Dome, Weld County, flowing 30-bbl. heads at 15 minute intervals. Oil between 40 and 44 gravity.

OKLAHOMA

New Logan County well opens new producing area. New work in older parts of State and leasing active in western counties.

KANSAS

Two possible western Kansas pools, one in Ellsworth County and one in Rooks County. Stafford County may develop large area.

NORTH TEXAS AND PANHANDLE

Both Panhandle and Wichita Falls production gains. Well north of Graham Pool showing for deep producer. Burkett Pool extended.

WEST TEXAS

Western Crane County wildcat proves large area for potential production; first well in West Texas to pick up production after sulphur water, and may lead to deeper drilling.

Ward County production extended. New semiwildcat producer in eastern Howard County.

Late Fields

KANSAS

Skelly Oil Co.'s No. 1 Miles, NE cor., Section 30-27-10w, Kingman County wildcat, found 7,000,000 feet of gas at 2,002-20 feet. The test is in the extreme northwest part of the county and indicates the possibility of another producing area in the western part of the State.

Midwest Exploration Co.'s No. 36 Richardson, SE cor., Section 36-22-12w, Stafford County wildcat, which found 5,000,000 feet of gas and swabbed 287 bbls. of oil from sand at 3,542-45 feet, was drilled deeper to a total depth of 3,599 feet where it flowed 320 bbls. in six hours and is now estimated at 1,200 bbls. a day. It is the only commercial producer in Stafford County.

Robertson and others' No. 1 in the SW cor. NE, Section 22-18-9w, Rice County, found 7,400,000 feet of gas at 2,019-20 feet, and the 10-inch casing was landed at 2,019 feet. The test was drilling deeper at 2,021 feet and the gas increased to 11,000,000 feet. It was shut down to determine the disposition of the gas.

Slick, Pryor & Lockhart and others' No. 1 Hecken, NW cor., Section 25-17-10w, Ellsworth County wildcat, was still shut down with 3,000 feet of oil in the hole from Silicious lime at 3,221-25 feet.

Valerius and Boucher Oil & Gas Co.'s No. 1 Todd, NW cor., Section 24-13-27w, Gove County wildcat, which is 75 miles from the nearest production, found water at 4,460-65 feet, and was underreaming the 6-inch casing to shut off the water.

Danciger Oil & Refining Co. and J. Durham announce a new location for No. 1 in the SW cor., Section 3-2-35w, Rawlins County, and have the rig up. The test is a wildcat and is the first ever drilled in the county. It is on a large block of acreage that is 15 miles long and 6 miles wide and will be drilled to a total depth of 3,500 feet. It is expected to test the Dakota formation, which is the lowest subdivision of the Cretaceous, and the Lakota formation. The test was located after a magnetometer survey of the area.

OKLAHOMA

Eason Oil Co.'s No. 1 Katschor, SW cor. NE SW, Section 34-17-4w, Logan County wildcat, may open another producing area in the western half of the State. The test cored the Layton sand at 4,918-42 feet where it flowed 510 bbls. the first 10 hours and the next 21 hours it made 842 bbls. The crew was prepar-

(Continued on Page 144)

SCORE SHEET ON OIL PRODUCTION

Below is shown allotted average daily production in the United States, April to December, inclusive, suggested by the Committee on Economics of the Federal Oil Conservation Board, and the actual daily average production during the week ending October 11:

	Allotted (bbls.)	Actual (bbls.)	Over (bbls.)	Under (bbls.)
California	610.000	591,000	.....	19,000
Oklahoma	655,000	548,645	.....	106,355
Texas	750,000	770,930	20,930	.....
Other fields	480,000	451,082	.....	28,918
Total	2,495,000	2,361,657	20,930	154,273

Net underproduction 133,343 bbls.

When it comes to Cargo Pumps the ship builder as well as the ship owner just instinctively turns to

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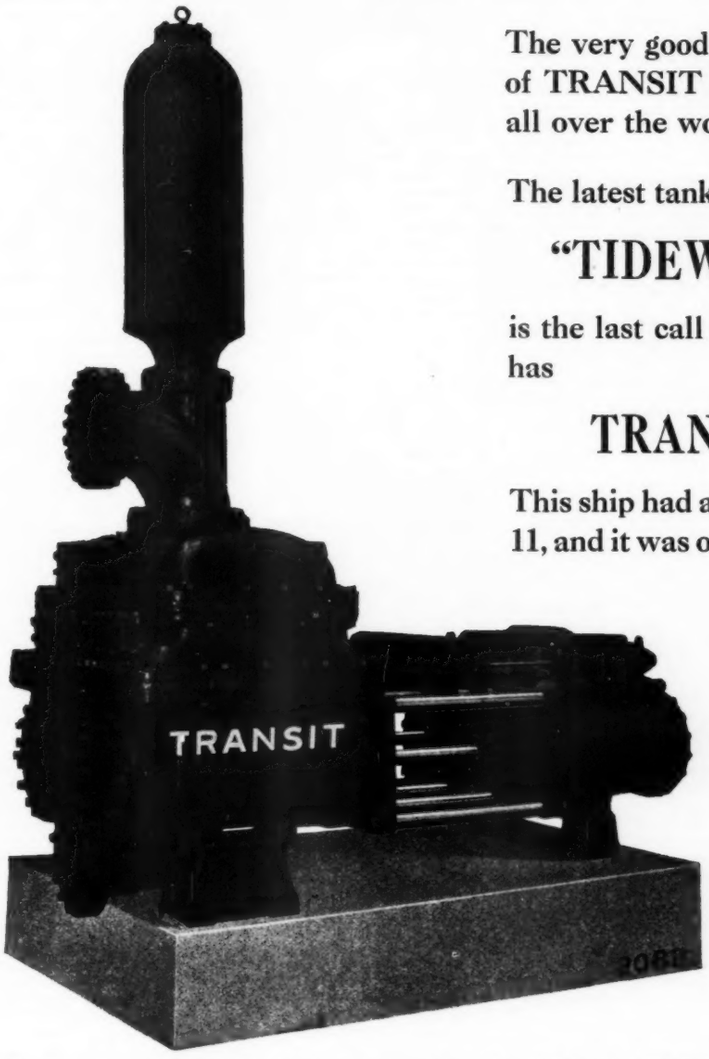

The very good reason is because literally hundreds of TRANSIT Pumps are making good on tankers all over the world.

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"TIDEWATER ASSOCIATED"

is the last call in tanker construction and of course has

TRANSIT CARGO PUMPS

This ship had a most satisfactory sea trial September 11, and it was our privilege and pleasure to be aboard at this trial.

"TIDEWATER ASSOCIATED" is driven by one of those wonderfully balanced Sun-Doxford opposed piston reversible oil engines. The operation is so smooth and the vibration so slight, that we thought we were on a turbine driven ship. And they told us that for thermal efficiency, these Sun-Doxfords just draw rings around any other type of ship drive.

But we are digressing—the point is: "TIDEWATER ASSOCIATED" has—

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and

1—12 x 8 x 12″ Vertical Duplex Transit Stripper Pump

and we are proud to have them on so fine a ship. We have pumps of all approved types for tankers.

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Tulsa, Okla., or any store.

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Los Angeles, California

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Pump & Machine Co.
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DISTRICT OFFICES

NEW YORK CLEVELAND PHILADELPHIA HOUSTON TULSA PITTSBURGH LOS ANGELES

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Phoenix, Ariz.

WOODWARD, WIGHT & CO.
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Oklahoma Holds Below Requirements

New Work Getting Under Way in the Older Parts of the State and Leasing Active in the Western Counties

By W. A. Spinney
Staff Correspondent, Oklahoma Fields

Oklahoma's production was again below the estimated requirements when the gauges for the week ending October 11, were approximately 548,500 bbls. a day. The Oklahoma Corporation Commission extended the proration order for another 10 days to October 20, making the allowable production in the State 550,000 bbls. a day during that period. In the older areas in the State new work is getting under way and the leasing of the western counties in the State is still active. Developments are continuing in the Golden Belt area west of Tonkawa in Kay County.

Production was extended to the west in the extreme southwest edge of the Oklahoma City Field by the Indian Territory Illuminating Oil Co.'s No. 8 State Land, SW cor. SE NW, Section 36-11-3w, which made 1,114 bbls. the first two hours and is estimated to be a 15,000,000-bbl. well. The gas volume was estimated at 9,000,000 feet. The oil was found in the Wilcox sand at 6,575-6,682 feet.

Cleveland County, which was in the limelight with several large wells on what now seems to be the south edge of the Oklahoma City Field, is being leased. These wells in the northern part of the county were the first to find production in that county. Anderson-Prichard Oil Corp. is closing a block in Township 10-4w, in the northwestern part of the county, about 6 miles southwest of the Oklahoma City Field. Other recent transactions in the county were by Amerada Petroleum Corp. in Section 8-7-1, in the southeastern part of the county; Gypsy Oil Co. in Section 5-7-1, and in Section 12-10-3w; Papoose Oil Co. in Section 8-9-1w; Skelly Oil Co. in Section 11-10-4w, and Shell Petroleum Corp. in Section 19-6-1.

Drill Deeper in Creek County

Creek County oil operators are planning to drill the older wells deeper. The majority of leases in that area are now paid out because of the long life of the wells and during the curtailment of production which limits all wells making 5 bbls. and over, to 50 per cent of the potential, new work of deepening is being done wherever possible. The area has a long record for consistency in drilling and is one of the older producing areas in the State. Pools have been found all over the county and several producing spots have been found in one township. Creek County is second in activity in the State, since the large Greater Seminole area has lost the lead to Oklahoma County. The majority of the older production in Creek County is from the shallow sands which have yielded large returns. It is expected a number of deep tests will get under way in these areas.

In Muskogee County

Eastern Oklahoma is active centering around Muskogee County. A renewal of drilling development is expected during the coming months. The play is expected to spread to nearby counties where wildcats now drilling may result in production. Indian Territory Illuminating Oil Co.'s No. 1 Blake, SW cor. NW, Section 3-10-21, Haskell County, is expected to test the deep horizons. Another wildcat in the same county is Midwestern Oil & Gas Co.'s No. 1 Polster, C NE SE, Section 33-10-22, which was shut down for water at 4,230 feet.

In Le Flore County, the Red Bank Oil Co.'s No. 1 fee, SE cor. SW NW, Section 23-9-24, was drilling below 6,300 feet. The test had the top of the Wilcox sand at 6,128 feet. A large volume of gas was found in the test which has been mudded off to search for a deeper oil pay.

Muskogee County continues to be active from a drilling standpoint and more shallow pools are expected to be found in the county before the end of the year. The activity includes development in all parts of the county.

Dewey and Blaine Counties

The Tom Slick Oil Co. has completed the block it acquired from Robert H. Acre in Dewey and Blaine Counties in the western part of the State. The tract is approximately 30,000 acres and is about 12 miles square and all but 5,000 acres of it is in Dewey County. The acreage covers Townships 17, 18 and 19, and Ranges 13w, 14w and 15w. Magnolia Petroleum Co. is the only major company holding acreage in the block, it being in scattered and checkerboard tracts extending north and south through the block. Adjoining the block on the west the Indian Territory Illuminating Oil Co. has a block of 6,000 acres, and southwest it has a block of 27,000 acres. On the south the Sinclair Oil & Gas Co. and Indian Territory Illuminating Oil Co. have blocks near the Tom Slick Oil Co.'s.

Sinclair Oil & Gas Co. and Indian Territory Illuminating Oil Co. have done considerable core drilling on each block with part of the work extending into the Tom Slick Oil Co. and R. H. Acre block. Magnetometer surveys have also been made of most of the northeastern part of Dewey and Blaine Counties.

Old Comanche Field

In southern Oklahoma the old Comanche Field in Stephens County was extended to the southeast by the completion of the G. Pace and others' No. 2 Dilly, NE cor. NW SW, Section 27-2s-7w. The new well is estimated to be a 150-bbl. well. It made 85 bbls. on the swab in nine hours and is being rigged up to pump. The sand was found at 1,498-1,505 feet. The well is a twin to a shallow gas well which found the sand at 934 feet.

Other wildcats in the vicinity are getting under way after delays caused by the recent rains. P. Turner and others' No. 1 Andrews, NW cor. SW SW, Section 5-2s-7w, has cement casing and is shut down. Harris & McNeil's No. 1 Parker, SE cor. NE SE, Section 11-2s-8w, has also cemented casing. Louis Sikes's No. 2 William Blake, NE cor. SW, Section 16-1s-8w, had a hole full of water after drilling the cement plugs. A showing of oil was found in sand at 2,145-53 feet.

In Tatums Pool

In the Tatums Pool in Carter County several new wells are expected to be completed in the next few days and other operations in the field have been resumed following a shut down on account of water shortage during the past few weeks. C. L. Anderson's No. 5 Eaves, NW cor. NE SW, Section 24-1s-3w, in the southeast extension is drilling the cement plugs at 2,280 feet, and will drill the sand series preparatory to completing. It is expected to be another big well as it offsets the same company's No. 4 Eaves, which made approximately 2,600 bbls. on its initial gauge. Trevlyn Oil Co.'s No. 4 Spigner, SW cor. NW, Section 24-1s-3w, was swabbing after drilling the cement plugs at a total depth of 2,525 feet. The well had 160 feet of sand. George Pace and others' No. 1 Mitchell, NW cor., Section 30-1s-2w, on the extreme southeast edge of the extension area, is estimated to be a 50-bbl. well from sand at 2,136-2,450 feet.

Vernon, Hale and Hudson's No. 1 Sontine, NW cor. SW SW, Section 19-1s-2w, on the southeast edge of the field, has been completed but an exact gauge is not available at this time. Wirt Franklin Petroleum Corp.'s No. 4 Mitchell, NE cor. SE SE, Section 24-1s-3w, is shut down with casing cement at 2,170 feet. The total depth of the test is 2,274 feet in the oil sand. It is shut down taking its proration time.

Cement Pool

Proration in the Cement Pool in Caddo County, has been lifted until the new proration order now being considered by the Oklahoma Corporation Commission, goes into effect. Curtailment of the production from the Cement Pool in Caddo County was removed during the week by Anderson-Prichard Oil Corp. which has been transporting the oil to its refinery at Cyril. Operators will be allowed to produce to full capacity until such a time as the new state proration order becomes effective.

The field was prorated when the production exceeded the capacity of the refinery, which is the only outlet for the oil in the vicinity, there being no other pipe lines in the field.

Several drilling tests in the field are expected to resume operations following the lifting of the restrictions. The Magnolia Petroleum Co. is one of the active companies in the field. Its No. 5 Hedlund, NW cor. NE, Section 11-5-9w, was completed as a gas well gauging 35,000,000 feet with a rock pressure of 1,800 pounds. The source of the gas is still undetermined. Casing was cemented at 4,511 feet and the sand was tested to 4,538 feet, where it failed to show anything after a production test. It was drilled deeper to a total depth of 4,576 feet when it blew in as a gas well. Same company's No. 3 White, SW cor. SE, Section 25-6-10w, on the northwest edge of the field was drilling at 3,770 feet in shale.

Oklahoma City Completions

The following wells were completed in the Oklahoma City Field. The majority of the completions were in the north and northwestern part of the pool. It is in this area the largest wells have been found, in the field and in the State. Skelly Oil Co.'s No. 1 Dillon, NE cor. SW, Section 2-11-3w, made 1,624 bbls. the first six hours from sand at 6,185-6,545 feet. Wirt Franklin Petroleum Corp.'s No. 1 Birge, NW cor. NE SE, Section 2-11-3w, flowed 2,546 bbls. the first 16 hours from sand at 6,222-6,487 feet. Indian Territory Illuminating Oil Co.'s No. 1 Lawton, NE cor. SW NE, Section 11-11-3w, flowed 1,721 bbls. the first 16 hours from sand at 6,280-6,578 feet. Century Petroleum Co.'s No. 1 Jefferson, NW cor. NE NE, Section 2-11-3w, made 535 bbls. the first 30 minutes from sand at 6,334-6,409 feet. Oils, Inc.'s No. 1 Ross, SE cor. NW NW, Section 2-11-3w, flowed 13,200 bbls. the first 3 hours and 25 minutes from sand at 6,261-6,550 feet. Phillips Petroleum Co.'s No. 1 Velt, NW cor. NE NE, Section 2-11-3w, flowed 5,705 bbls. the first 10¼ hours from sand at 6,340-6,443 feet. Indian Territory Illuminating Oil Co.'s No. 1 Lemon, Section 11-11-3w, was bailed and shut in from a total depth of 6,580 feet. It was estimated to be 100 bbls. an hour. Same company's No. 7 State Land, NW cor. SE NW, Section 36-11-3w, flowed 5,407 bbls. in 15 hours and 50 minutes from sand at 6,585-6,678 feet. Same company's No. 9 Johnson, NW cor. SE NW, Section 25-11-3w, made 2,066 bbls. the first 16 hours from sand at 6,250-6,510 feet. Tom Slick Oil Co.'s No. 1 Wilson, NW cor. SW SW, Section 2-11-3w, flowed 2,231 bbls. the first hour and the gas was estimated at 43,000,000 feet from sand at 6,265-6,526 feet. Indian Territory Illuminating Oil Co.'s No. 1 Coppenger, NE cor. NW, Section 11-11-3w, flowed 1,980 bbls. the first 14 hours and 10 minutes from sand at 6,225-6,488 feet. Same company's No. 1 Spanagle, NE cor. NW NE, Section 11-11-3w, made 5,475 bbls. the first seven and three-quarters hours, with a back pressure of 600 pounds from sand at 6,345-6,488 feet. Same company's No. 5 H. G. Trosper, in Section 14-11-3w, made 118 bbls. the first eight hours from sand at 6,230-6,528 feet. Same company's No. 8 State Land, in Section 36-11-3w, flowed 1,114 bbls. the first two hours from sand at 6,575-6,682 feet. Tom Slick Oil Co.'s No. 1 Danruther, in Section 2-11-3w, made 740 bbls. the first 10½ hours from sand at 6,430-6,575 feet. Jack Shaffer's No. 1 Vinita Park, SE cor. NW NW SW, Section 2-11-3w, made 620 bbls. the first hour and a quarter from sand at 6,224-6,451 feet.

Seminole County

The Amerada Petroleum Corp.'s No. 1 Tiger, NW cor. NE SW, Section 3-8-5, Seminole County, which started the de-

(Continued on Page 120)

WILDCAT OPERATIONS IN OKLAHOMA

(Descriptions are East and North unless marked otherwise)

NORTHERN OKLAHOMA

ALFALFA COUNTY

Company, farm and location— —	Remarks:
Smith Brothers' No. 1 Forbes, SE cor. NW NW Sec. 12-27-11w	Shut down 1,232 ft.
J. W. Bailey's No. 1 Acre, SW cor. NE Sec. 14-24-11w	Rigging up standard tools 4,660 ft.; shut down.

BECKHAM COUNTY

Mid-Continent's No. 1 Schaff, C NE SW Sec. 22-11-22w	Rig.
Ray Johnson and J. R. Cuniff's No. 1 Brower, C NW Sec. 29-10-22w	Shut down 3,784 ft.
Producers Exploration Co.'s No. 1 Sidell, SE cor. SW SW Sec. 17-9-22w	Shut down 2,402 ft.
Carson et al's No. 1 Danby, SW cor. SE NE Sec. 20-8-22w	Shut down 1,606 ft.
White et al's No. 1 Green, SW cor. Sec. 34-10-24w	Shut down 1,320 ft.

BLAINE COUNTY

Washoma Oil Co. et al's No. 1 Phillips, C NW SW Sec. 13-19-10w	Drlg. 3,805 ft.; set 6-in. csg.

CADDO COUNTY

Abernathy & Brown's No. 2 Houston, Sec. 24-6-11w	Drlg. 1,075 ft.
Simms Pet. Co.'s No. 1 Cobsa, SW NW Sec. 24-6-11w	Drlg. 1,035 ft.

CHEROKEE COUNTY

Weaver & Proctor's No. 1 Benge, NE SE Sec. 8-14-21	Shut down 510 ft.

CLEVELAND COUNTY

Harris et al's No. 1 Highbee, SE NW Sec. 20-6-1	Shut down 6,518 ft.

COAL COUNTY

Western Oil Co.'s No. 1 Gum Bros., C SW NW Sec. 30-3-10	Rig.
A. M. Van Orden's No. 1 Jamison, SE SW Sec. 31-1-9	Shut down 1,668 ft.
Blackwell O. & G. Co.'s No. 1 L. Jackson, NW cor. Sec. 26-3-9	Drlg. 4,275 ft.
W. E. McGraw's No. 1 King, C SW NE Sec. 11-1-8e	Shut down 3,030 ft.

(Continued on Page 154)

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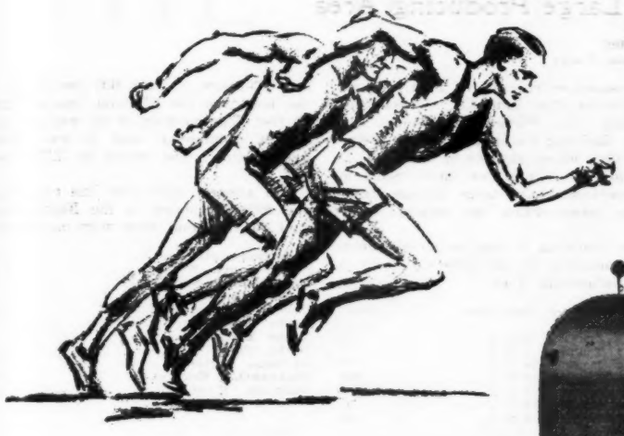

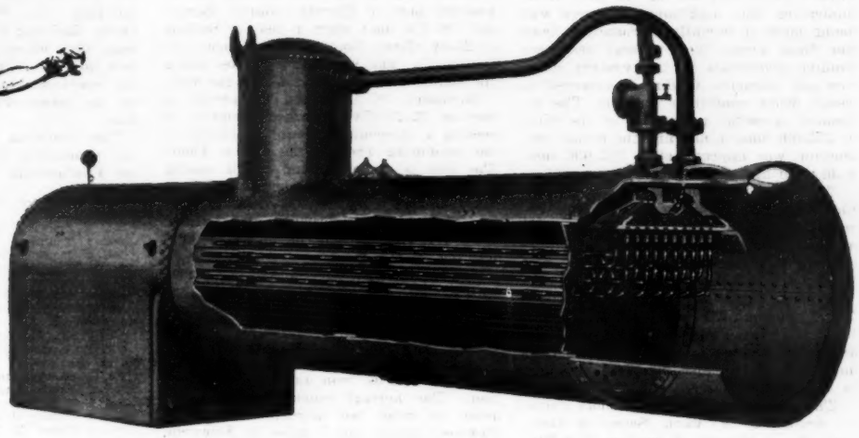

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Two Possible Western Kansas Pools

One in Ellsworth County and One in Rooks County. Stafford County May Develop Large Producing Area

By W. A. Spinney
Staff Correspondent, Kansas Fields

Very little change took place in the State's production during the past week, indicating that additional progress was being made in curtailing production from the flush areas. New wildcat tests are finding production in the western counties and intensive drilling is expected to result when conditions warrant. The estimated potential production of the State is 155,000 bbls. a day and the actual production was approximately 115,600 bbls. a day for the week ending October 11.

Two new oil pools may be opened in the western part of the State as the result of recent wildcat tests finding commercial production and many believe proving considerable acreage. The new wells were in Rooks and Ellsworth Counties. Slick, Pryor & Lockhart and others' No. 1 Heiken, NW cor., Section 25-17-10w, Ellsworth County, is about 10 miles from the nearest production, which is northwest. It is also the first producer in Ellsworth County.

The other producer is in Rooks County, drilled by Aylward. Seeley & Boyston's No. 1 Silvers, in Section 21-8-19w, and is more than 20 miles from the nearest production, being the most northwesterly producer in the State.

Ellsworth County Well

The latest reports indicate the Slick, Pryor & Lockhart's No. 1 Heiken, found the pay in the Silicious lime at 3,212-25 feet. The oil rose 2,500 feet in the hole in three hours. The test is also making gas from the Lansing horizon at 2,980-91 feet which is estimated at 7,000,000 feet.

Some estimated the Rooks County test at 500 bbls. a day. It found the pay in the Conglomerate at 3,370-3,440 feet where the oil rose 1,100 feet in the hole in 30 minutes, and 2,500 feet in a few hours.

The wildcat test of Jasper & Beschka's No. 1 Cupp, SW cor. NE, Section 21-18-9w, Rice County, which has 7,000,000 feet of gas from an upper pay horizon at 2,010-20 feet, will be bradenheaded. The gas was found in the 12-inch hole and was flowing rocks and mud high into the air.

East of Winfield

In the new district east of Winfield in Cowley County, where Roth & Faurot's No. 1 Brandt, in Section 12-32-4, is making 400 bbls. a day from the Kansas City lime at 2,570-74 feet, the twin test missed the shallow gas sand at 700 feet and is being abandoned. The twin was drilled 100 feet to the north and failed to find the gas the discovery well had at that depth. New work in the area is increasing, two other tests are drilling, both being offsets to the discovery well.

Another county in western Kansas which many expect to develop into a large producing area is Stafford County. The Midwest Exploration Co.'s wildcat in Section 36-22-12w, was drilled deeper and increased its production and was swabbing 50 bbls. an hour. The well was making around 250 bbls. a day at 3,541-55 feet and after drilling 4 feet deeper swabbed 340 bbls. in six hours. The Atlantic Oil Producing Co. is preparing to drill the south offset.

Reno County Tests

A drilling campaign may result from the recent completion of the Empire Oil & Refining Co.'s No. 1 Haury, in Section 1-23-4w, Reno County, which made 22,000,000 feet of gas at a total depth of 3,333 feet. The leases in the area are owned by different companies and four tests are expected to be started in the near future. Independent Oil & Gas Co. is preparing to start a test in the NW cor. NE Section 1-23-4w, the east offset to the gas well. Amerada Petroleum Corp. is preparing to start a test in Section 5-22-3w, in the extreme northwestern part of Harvey County. Barnsdall Oil Co. may start a test in Section 11-23-4w, Reno County. Mid-Kansas Oil & Gas Co. has a block of leases along the county line, northeast of the gas well.

Barnsdall Oil Co.'s No. 1 Carroll, in Section 32-25-17w, Edwards County, is seeking a three-quarter mile extension to the producing area in the Lewis Field. The test is underreaming 8-inch casing at 4,420 feet. British-American Oil Co.'s No. 1 McCarty, in the NE cor. NW Section 31-25-17w, the discovery well, is now making around 20 bbls. of oil and 3,000,000 feet of gas.

Approximately 640 acres of state-owned land, comprising part of the Arkansas River in Pawnee and Edwards Counties, in western Kansas, was leased by the State to the Derby Oil Co. The area is in wildcat territory and is approximately 60 miles from any other production. The acreage consists of about 4 miles of river bed acreage located in Pawnee County and 5 miles in Edwards County. The acreage under lease is estimated to consist of about 290 acres in Pawnee County and 350 acres in Edwards County.

Voshell Potential

The new potential tests for the Voshell Pool in McPherson County show the field has a potential of 68,233 bbls. a day, a slight increase over the previous gauge taken the month before. The average pipe line outlet in the area is 8,800 bbls. a day for the current month. The operators are permitted to produce 12.78 per cent of the potential during the 30-day period. The co-operation of all the operators in the field is evidenced by the fact that all the leases are within a few barrels of the allotted amounts for the previous period. The entire field shows a shortage of 73 bbls. for the previous 30-day period. The Derby Oil Co.'s Stucky lease in N half SE Section 9-21-3w has a potential of 8,608 bbls. from eight wells, the largest in the field.

Eastborough Potential

The potential production from the Eastborough Pool in Sedgwick County, was estimated to be 11,220 bbls. from 20 wells the week ending October 10, and is has the largest potential production of any pool in the county. The pipe line companies are taking approximately 7,200 bbls. a day from the area. Five pipe line companies running oil from the area are Prairie Pipe Line Co., Golden Rule Refining Co., Vickers Petroleum Co., Derby Refining Co. and Magnolia Petroleum Co., which expects to complete its new pipe line in a few days. Some of the operators have large storage tanks on the leases which can handle 10,000 bbls.

The following is the estimated potential production of the different wells in the Eastborough Pool:

Company, well, location—	Bbls.
Fisher-Lauck:	
No. 1 Trustee, 19-27-2	120
No. 2 Trustee, 19-27-2	450
No. 3 Trustee, 19-27-2	700
No. 4 Trustee, 19-27-2	800
No. 5 Trustee, 19-27-2	1,000
No. 6 Trustee, 19-27-2	700
No. 1 Shaffer, 19-27-2	400
Blankenship:	
No. 1 Shaffer, 19-27-2	500
No. 2 Shaffer, 19-27-2	450
Derby Oil:	
No. 1 Eastborough, 19-27-2	600
No. 2 Eastborough, 19-27-2	1,000
No. 1-A Eastborough, 19-27-2	140
No. 1 Cloud, 19-27-2	500
No. 1 Rimel, 19-27-2	1,500
Vickers:	
No. 1 Keys, 30-27-2	1,000
No. 2 Keys, 30-27-2	130
No. 3 Keys, 30-27-2	150
National Refg.:	
No. 1 Murdock, 19-27-2	800
Magnolia:	
No. 1 Wheeler, 19-27-2	350
Prod. & Refrs.:	
No. 1 Mackey, 30-27-2	30
Total	11,220

Rice County Wildcats

Two Rice County wildcats were showing oil and gas. Jasper & Beschka and Robertson's No. 1 Cupp, SW cor. NE, Section 22-18-9w, a wildcat in the western part of the county, found a showing of gas at 2,010-20 feet that was estimated at 2,500,000 feet. It was drilled deeper and increased to 5,000,000 feet at 2,050 feet. The test is about 2½ miles from the Shell Petroleum Corp.'s No. 1 Ploog, in Section 33-18-9w, another wildcat well that was recently completed for an estimated 2,000 bbls. a day in the Silicious lime. Some express the opinion that Rice County has a large potential production, when the industry is in a better condition to permit the different areas to be drilled. The other wildcat test showing oil was E. H. Langston, H. C. Detrick and J. Lenox's No. 1 Mowery, C NE, Section 34-19-9w, about 6 miles south of the Shell's No. 1 Ploog, in Section 33-18-9w. It had 600 feet of oil in the hole from the Silicious lime at 3,236-70 feet. The showing of oil was not considered commercial and it was drilled deeper and found water at 3,390-3,401 feet.

The average daily pipe line runs from the different leases in the Eastborough Pool for the same week were as follows:

Company and lease—	Bbls.
Fisher-Lauck, Trustee	2,528
Fisher-Lauck, Schafer	262
Vickers, Key	1,012
Derby, Eastborough	1,120
Derby, Rimel	580
Derby, Eastborough (A)	120
Derby, Cloud	398
National, Murdock	540
Blankenship, Schafer	430
Magnolia, Wheeler	250
Prod. & Ref., Mackey	20
Total	7,267

Production from the Oxford Pool in Sumner County averaged 8,270 bbls. a day for the week ending October 10. It is the lowest average for the year. The output by pools was as follows: Churchill Pool in Sumner County, 3,660 bbls.; Oxford Townsite of Sumner County, 2,465 bbls.; Rainbow Bend, Cowley County, 1,580 bbls.; Carson-Waite in Sumner and Cowley Counties, 465 bbls.; Miller district, Sumner County, 1,000 bbls.

Ritz Area

In the Ritz area of McPherson County, The Texas Company's No. 3 Munn, NE cor. SE NE Section 12-20-3w, was the fourteenth well completed in the area. The well made 3,365 bbls. the first 24 hours from the chat at 2,920-82 feet. This well offsets the Phillips Petroleum Co. and Tom Palmer's No. 1 Winn, which was also a 3,000-bbl. well. These two wells have resulted in several other tests drilling in the vicinity.

North of the Ritz Pool, Mid-Kansas Oil & Gas Co.'s No. 1 Garrett, SW cor. NE Section 30-19-1w, McPherson County, had the top of the chat at 2,940 feet. The test is an offset to W. C. McBride, Inc.'s Whitwright, which was an extension in that area and made on its initial production test 140 bbls. in 24 hours.

Mid-Kansas Oil & Gas Co.'s No. 1 Lindberg, C NE Section 15-19-2w, in the Decker gas field, was drilling in the chat at 2,922 feet, with an estimated 1,000,000 feet of gas showing. The test was drilled deeper to a total depth of 2,952 feet and is being completed for 11,000,000 feet of gas. It adds another gas well to the Decker gas field in the eastern part of the McPherson County.

Greenwood County, Test

The Aladdin Petroleum Corp.'s No. 1 Andrews, in Section 26-22-10, Greenwood County, is being drilled to establish the trend to the south from the old De Malorie Pool. The same company recently completed its No. 1 Harris, in Section 19-22-10, which extended production in that area. The outcome of the offsets to the Harris well led many to believe that the pay may extend to the southwest. The test is expected to reach the pay horizon in about 10 days.

Barber County

Barbara Oil Co. moved the rig in for No. 1 F. F. Root, C W half NE. Section 25-33-13w.

Coffey County

Spencer and Derby Oil Co.'s No. 2-B Guy, SW cor. NE NW, Section 29-23-15, has been abandoned at 1,655 feet.

Cowley County

Hall and others' No. 1 Jarvis, C NW SW, Section 19-33-6, is spudding. The Prairie Oil & Gas Co.'s No. 1 Harris, C SW SE, Section 7-31-6, has been completed for a dry hole at 2,980 feet.

Ellis County

Barefield and others' No. 1 Gatewood.

(Continued on Page 123)

WILDCAT OPERATIONS IN KANSAS

(Descriptions are East unless marked otherwise)

BARBER COUNTY

Company, farm and location—	Remarks:
Barbara Oil Co.'s No. 1 Hamblin, SW NW Sec. 24-33-13w.	Fishing 4,487-4,508 ft.; 20,000,000 ft. gas; T. D. 4,528 ft.; comp.

BARTON COUNTY

Skelton Oil Co.'s No. 1 Ott, C SE SE Sec. 16-19-14w	Rig.
McCool et al's No. 1 Tsern, NW SE NE Sec. 12-20-11w	Shut down 1,600 ft.

BUTLER COUNTY

National Ref. Co.'s No. 1 Settergren, NW cor. Sec. 32-26-4.	Drlg. 2,280 ft.
McCulloch and Empire's No. 1 Lilley, SW NW NW Sec. 23-23-5	Drlg. 600 ft.
Farrell et al's No. 1 Sutton, NW cor. Sec. 18-28-7	Shut down 830 ft.

CHAUTAUQUA COUNTY

CLARK COUNTY

Watchorn's No. 2 Morrison, NW NE Sec. 20-32-21w	Drlg. 6,810 ft.

CLAY COUNTY

Crystal Oil et al's No. 1 Tivier, SW cor. Sec. 19-8-2	Shut down 1,810 ft.

COFFEY COUNTY

Heyburg's No. 1 Kroft, SE SW SE Sec. 30-22-14	Drlg. 310 ft.
McGregor's No. 1 Wood, NE NW SW Sec. 20-22-15	Shut down 650 ft.
Roberts et al's No. 1 Hay, SW SE NW Sec. 32-22-15	Drlg. 1,125 ft.

COWLEY COUNTY

Roth & Farout's No. 1 Reedy, SW NW NE Sec. 8-32-8.	Fishing 912 ft.
Tom Fine's No. 1 Boyd, NW NE Sec. 32-32-4	Shut down 3,650 ft.

DICKINSON COUNTY

Severs et al's No. 1 Lavengood, NE SW Sec. 13-13-2	Drlg. 2,410 ft.
E. N. Morgan's No. 1 Whithair, NW SE Sec. 9-12-1	Shut down 3,340 ft.

DOUGLAS COUNTY

Steinbuckle's No. 1 Unknown, SW NE NW Sec. 34-14-21.	Shut down 1,100 ft.

ELLIS COUNTY

Central Commercial Oil Co.'s No. 1 Helms, SE cor. NE Sec. 2-12-20w	Drlg. 3,916 ft.
Rush Oil Co.'s No. 1 Gatewood, NW cor. NW Sec. 4-15-20w	Shut down 3,825 ft.

(Continued on Page 157)

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AMERICAN INDUSTRY NEEDS MORE NATURAL GAS

Another Test in New Duval County Pool

Discovery Well in Northwestern Section Is Pumping and Flowing an Average of 310 Bbls. Daily With Storage Full

By B. D. Stevenson
Staff Correspondent, Southwest Texas Fields

SAN ANTONIO, Tex., Oct. 13.—It was a rather light week in Southwest Texas as a whole, last week, though the Balcones fault territory east of San Antonio registered some increase all around. In the Laredo district it was the lightest week in months, with only four producers completed, two oil wells of 60 and 120 bbls. and two gas wells, one 12,000,000 and one 15,000,000 feet. One gasser was in the Cole Pool and the other producer all in the Escobas-Muckelroy Pool.

Announcement was made that the Vacuum and S.R.C. will start another test in the new pool they opened in northwestern Duval County, 5 miles from the north and west lines of the county where the discovery well is surprising everybody by pumping and flowing an average of 310 bbls. pipe line oil per day with all storage full and going into earthen tanks, while the Magnolia Pipe Line Co. is hurrying an extension from its main Laredo-Luling line 8 miles away.

Vacuum Oil Co. had the original lease on the 65,000 acres of the Duval County Ranch Co. and the S.R.C. Oil Co., in which T. B. Slick's estate is interested, went in on a deal on a block of 10,000 acres out of the ranch. This discovery well perpetuates that lease and they are now starting the second well, which is 1,050 feet from the east line and 2,050 feet from the north line of Survey 293, the same survey in which the discovery well is located. Production is had in sand at 1,718-24 feet and is 19 gravity. Al Buchanan owns an eighth interest in the 10,000-acre deal and is drilling the second well, which is a little southwest of the first.

Vacuum Oil Co. is starting another well on Survey 280, which is about 4 miles southwest of the discovery well. Its lease on the 65,000 acres provides that one producer perpetuates the lease on only one-third of the ranch. Development of the new pool will be entirely a unit proposition. The oil, if it tests like other Mirando crude of that gravity, will be of the lubricating quality that is in demand with the Vacuum Oil Co.

Escobas-Muckelroy Field

In the Escobas-Muckelroy Pool in Zapata County the number of operations in the field at the close of the week was 14 and it has been recently as high as 40. There is still a lot of undeveloped territory in the proven area between the two ends of the field.

There were no abandonments last week in the Laredo district and there were six new locations.

Tests of Interest

Magnolia Petroleum Co. is going back into No. 3-A Benavides in the center of Survey 174 in the southwest part of Duval County in the O'Hern-Seacord Pool. The well was carried to 1,738 feet at which depth O'Hern and Secord got some oil production. Later one of the O'Hern-Seacord tests in that survey was carried to below 2,700 feet and got considerable production and later Magnolia on offset acreage got production in its No. 1 Benavides at below 2,700 feet. Deepening No. 3-A is another attempt at the deep production.

Late in the week S.R.C. Oil Co.'s No. 1-C in Block 14 of Survey 412 in Zapata County, a half mile north of production in the Escobas-Muckelroy Pool, after going through a cap at 1,218-22 feet went into an oil sand.

Pettus District

There were some completions in the Pettus Field that added production but no new sands or extensions. In the Pettus area the Quincy ranch test of William F. Morgan and the Independent Oil & Gas is down 4,971 feet and drilling. It was at 4,947 feet that it had a showing of gas that warranted setting casing which later didn't develop sufficient volume.

Houston Oil in the Pettus Field completed No. 1 on Block 39 of the townsite and No. 1 on Block 32 of the townsite and with the exception of one other test this completes that company's work in the townsite. The well on Block 39 made 20,000,000 feet of gas and the one on Block 32 is estimated at the same amount of gas. Humble's No. 7 McKinney, a south offset to the townsite, is a 250-bbl. well, and Buchanan & Lefevre's No. 1 in Block 20 of the townsite is an 800-bbl. well on half-inch choke.

Of the tests in the coast counties that have been watched closely, the Independent Oil & Gas Co.'s No. 1 Baldwin is down 5,485 feet and drilling. It has had some additional encouraging showings but not enough to stop on. It is now one of the deepest holes ever drilled in that territory.

In Northwestern Live Oak County two tests are getting started that will be watched because locations have been carefully made and they will be deep holes. One is the Tul-Tex Oil Co.'s No. 1 Jacob, 4 miles north of the Calliham Field in the west edge of the county, which is rigging up, and the other is the Sid Geoughan No. 1 Terrell, about 2 miles east of the Tul-Tex test and down about 500 feet and with surface casing set. Both tests will go around 4,500 feet.

Southwest Texas Production

Average daily production week ending October 11:

Branyon	24
Bruner	16,105
Buchanan	151
Chapman	10,764
Dale	292
Duval	288
Darst Creek	44,700
Kingsville	124
Larremore	33
Luling	9,344
Lytton Springs	760
Manford	280
McMullen	15
Medina	22
Mirando	13,680
Mineral	25
Pettus	8,394
Saxet	60
Somerset	1,486
Yoast	310
Total	106,857
Week ending October 4	109,881
Decrease	3,024

Balcones Fault Counties

There were 12 wells completed in the Darst Creek Field, five by the Gulf Production Co., one by the Humble and three each by the Magnolia and Texas companies. Some were pretty good sized wells. Gulf's No. 11 Dix-McKean came in for 3,000 bbls. Humble and Gulf each got some 1,000-bbl. wells, Magnolia three for about 500 bbls. each and Texas two for 600 and one for 840 bbls.

Gauging of the Darst Creek Field was not completed at the close of the week and it will probably be the middle of the week before the new proration figures are out but enough wells have been gauged to indicate the potential of the field will run to somewhere around 160,000 to 175,000 bbls. per day. It is a surprisingly large figure though the field has been completing some big wells lately and quite a large number of new wells have been completed since the field was last gauged for proration.

Balcones Wildcats

Among the disappointments in the Balcones Fault zone east of San Antonio is Grayburg's No. 2 Wells, 4 miles or more southeast of the Darst Creek Field. It topped the chalk at about the same depth as No. 1 Wells and drilled on down to the Edwards which was dry though porous and the test has been abandoned. Geophysics seemed to indicate there is a structure in that part of the country and geologists worked out a structure also. Total depth of No. 2 Wells is 3,958 feet.

Penn Oil Co.'s No. 1 Cooksey in the southeastern part of Bexar County in the Taylor marl at 1,460 feet after setting casing tested last week and made a small well. It was a little disappointing after the good showing the test had made when it first ran into the sand but not so disappointing considering the Taylor marl has never done anything very big. Somerset Field in Bexar County is about the best production the formation has ever given up. Furthermore the test was not intended for the shallow formations but for the Edwards lime.

A. H. Wray's No. 1 Burns estate in northeastern Frio County, 30 or 40 miles west of Penn's No. 1 Cooksey, was not expected to be drilled in and tested till about the middle of this week. Its total depth is 2,368 feet and it is also a Taylor marl proposition which showed a lot of gas.

Gulf Production Co.'s (Herts & Thomas) No. 1 Kelley in the Dale-Buchanan Pool is dry and abandoned in the Edwards at 2,488 feet. It is in Caldwell County and in a country where the fault lines are well proven and where

(Continued on Page 123)

SOUTHWEST TEXAS PROVEN AREAS

DOBROWOLSKI POOL—BEXAR COUNTY

Company, farm and location—	Remarks:
Eckert & Son's No. 1 Brehm, 150 ft. from N line, 1,500 ft. from E line, 118-ac. tract, P. L. Buquor Sur.	Location.
Eckert & Son's No. 8 L. Sandemer, 625 ft. from S line, 1,155 ft. from W line, Sur. 52	T. D. 318 ft.; drlg.
Gatlin Oil Co.'s No. 1 Tee, 150 ft. from NE line, 2,000 ft. from SE line, 279-ac. tract, Juan Montes Sur.	Location.
Morgan Bros.' No. 3 Masterson, 300 ft. S of No. 2 Masterson, Miguel Gortaris Sur.	T. D. 550 ft.; set csg.
Pen-Tex Oil Co.'s No. 5 Sandemer, 300 ft. S of No. 4 Sandemer	Location.
Pen-Tex Oil Co.'s No. 6 Sandemer, 300 ft. S of No. 5 Sandemer	Location.
W. R. Swearingen's No. 2 Halberdier, 300 ft. SE of No. 1, J. Perege Sur.	T. D. 400 ft.; drlg. rock.
A. J. Swearingen's No. 6 Sandemer, 600 ft. S of No. 1, M. Manchaca Sur.	Location.
A. J. Swearingen's No. 7 Sandemer, 300 ft. S of No. 6, M. Manchaca Sur.	Location.

DARST CREEK FIELD—GUADALUPE COUNTY

Gulf Production Co.'s No. 6 Thomas Dix, 470 ft. from NE line, 150 ft. from SE line of lease, J. R. Robinson Sur.	T. D. 2,556 ft.; completed for 600 bbls.
Gulf Production Co.'s No. 10 Dix-McKean, 600 ft. SW of No. 9, 150 ft. from SE line of lease, J. R. Robinson Sur.	T. D. 2,629 ft.; completed for 1,000 bbls.
Gulf Production Co.'s No. 11 Dix-McKean, 450 ft. from NE and NW lines of lease, J. R. Robinson Sur.	T. D. 2,605 ft.; completed for 3,000 bbls.
Gulf Production Co.'s No. 3 C. Anderson, 150 ft. from N line, 195 ft. from E line of lease	T. D. 2,582 ft.; completed for 1,584 bbls.
Gulf Production Co.'s No. 3 Knoblock, 150 ft. each way out of the NE cor. of the Gulf's Knoblock lease	T. D. 2,501 ft.; completed for 1,080 bbls.

(Continued on Page 118)

WILDCAT OPERATIONS IN SOUTHWEST TEXAS

ATASCOSA COUNTY

Company, farm and location—	Remarks:
Frontier Oil Co.'s No. 2 Boynton, 775 ft. SW of Brown-Fuller gas well	T. D. 2,542 ft.; drlg. Buda.

BLANCO COUNTY

Anderson & Manning's No. 1 Speer, 600 ft. to S line, 800 ft. to W line, John W. Speer Sur.	Moving in rig.
Ben H. Ashe Pet. Corp.'s No. 1 Glasscock, moving in to drill on leases out of the Rodson block north of Blanco City	Location.
Hardy-Sitton's No. 1 McMillan	T. D. 340 ft.; drlg.
Liles-Adams et al's No. 1 Stanford, 150 ft. to S line, 1,420 ft. to E line of James Stanford's No. 155	T. D. 580 ft.; drlg.
McCleary et al's No. 1 Schenling, 900 ft. to SE line, 600 ft. to S line of J. A. Rouse No. 118 Sur., 4 miles SW from Blanco City	T. D. 660 ft.; shut down.
J. R. Meek's No. 1 Walker, 360 rds. from W line, 482 rds. from S line of 375-ac. tract in Sur. No. 23	T. D. 900 ft.; running csg.
C. Rosenfield's No. 1 Hohenberger, 800 ft. to W line, 1,250 ft. to N line, Sur. No. 94	T. D. 450 ft.; drlg.

BASTROP COUNTY

Pacific Oil & Gas Co.'s No. 1 J. M. Litton, 150 ft. N and W lines of tract	Will change location.
Majestic Pet. Co.'s No. 1 J. M. Breeding, 160 ft. from N line, 1,020 ft. from W line of 200-ac. tract, 940 varas from W line, 1,225 varas from S line of M. Andrews Sur., 13 miles W from Smithville	T. D. 76 ft. (corrected); shut down.
Champion et al's No. 1 Smith, 2,541 ft. to NW line, 663 ft. to SW line of tract, E. Standifer Sur.	T. D. 1,990 ft.; drlg. chalk.
Texas Pet. Products Co.'s No. 1 Trigg, Stewart Sur.	T. D. 500 ft.; drlg.
R. S. Bolling's No. 1 McWilliams, 150 ft. from N line, 1,111 ft. from W line of Wm. McWilliams tract, Glasscock Sur.	Spudded.

BROOKS COUNTY

Humble Oil & Refining Co.-Shell Pet. Corp.'s No. 2 Wm. Singers, 1,320 ft. W of E line, 1,800 ft. S of N line of Sec. 312, Alta Verde area, 7 miles SE from Lasater gas field	T. D. 5,110 ft.; abandoned.

(Continued on Page 119)

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GENERAL OFFICES: HOUSTON, TEXAS

Barbers Hill Develops New Possibilities

Another Good Well on South Side of Dome. Prospects for Sub-Salt Production. Renewed Interest in Refugio Area

By Nell Williams
Staff Correspondent, Gulf Coast Fields

HOUSTON, Tex., Oct. 13.—The new development under way at Barbers Hill for production in sands underlying the overhanging ledge of cap rock and salt found there resulted late in the week in the completion of another good well, Sun Oil Co.'s No. 6 Chambers County on the south side of the dome. This well, which had drilled through approximately 400 feet of salt topped at 2,572 feet, found the pay at a total depth of 4,622 feet and came in flowing at the rate of 1,320 bbls. daily on a half-inch choke.

In reversal of general procedure in salt dome development in which deep sand production has been found off the sides of the dome, this well is one of a series of tests which have been and are drilling around the rim of the dome on the inside of the present circle of deep production. In previous operations, tests on this inside circle topped cap rock and salt and in view of the belief that the salt was a solid base underneath and could not be drilled through, the tests were abandoned. Since the recent revolutionary discovery that the outer circle of the dome is only a false top or protrusion from the central salt mass, interests at Barbers Hill has been centered on the exploration of sands underlying this ledge. That some of Barbers Hill's most prolific production may be found from this source is expected in that the deep sands found farther out from the dome are topped much higher under the salt where they flank the central part of the salt. Considering the fact that Barbers Hill is one of the largest domes on the coast and has been proved for production entirely around its circumference, the prospects for subsalt production as a result of these discoveries promise to make this field one of the biggest producers of oil the coast has known so far.

Barbers Hill Completions

Barbers Hill led the entire Gulf Coast in number of completions and out of the total of 13 producers reported from all fields, six were at Barbers Hill. On the southwest side of the dome, Yount Lee Oil Co.'s No. 1 Zadie Fisher, which last May was brought in as the discovery well on the southwest side, was one of the completions, it having been redrilled to the sand. This well originally was completed in a sand at a total depth of 6,661 feet flowing 2,100 bbls. daily. However, it failed to hold up and was put on the pump making considerable water. After being on the pump for several weeks it unexpectedly came back in flowing better than 5,000 bbls. daily but again fell off and went to water. It then sidetracked the old hole and drilled back to a total depth of 6,700 feet where seven joints of screen were set and the well completed flowing 720 bbls. of fluid, 30 per cent water.

On the east side of the dome, Yount Lee Oil Co. got a good well in its No. 5 Phillips, which is flowing 1,050 bbls. daily on a half-inch choke from sand at a total depth of 5,231 feet. This is an inside edge well. Another inside edge well in the same district was Sun Oil Co.'s No. 11 Wilburn fee, which was completed in a shallower sand at 3,435 feet pumping 350 bbls. of oil. Sinclair Oil & Gas Co.'s No. 4 McKinney, an inside well on the east flank, was completed on the pump for 15 bbls. daily at 5,250 feet. The other two completions were workovers, Humphreys Corp.'s No. 2-H Kirby, pumping 45 bbls., 30 per cent water, at 5,304 feet, and McAlbert Oil Co.'s No. 5 Woodward, pumping 156 bbls. at 5,249 feet.

On the extreme northeast side of the dome, Humphreys Corp. has abandoned its No. 2 Scott after drilling to a total depth of 7,697 feet in shale. This well, approximately 2,500 feet northward around the dome from the farthest north production on the east flank and virtually a rank wildcat, was completed during June as a small pumper in a sand at 7,296 feet, but not being commercial, was deepened in search of possible lower sands.

Refugio Developments

That the old part of the Refugio district still is in line for some good production from the 3,600-3,700-foot sand, which had been considered drilled out, was indicated late in the week with the completion of Union Producing Co.'s No. 10 Fannie Heard which is flowing between 800 and 1,000 bbls. daily. This well is in one of the highest parts of the Refugio area, formerly producing gas from this level. It was drilled there on the strength of showings made in a number of wells which lately have been increasing in flow and where a former gas well started making oil. It is the theory the big drop in gas pressure lately in the Refugio district has permitted the oil to come in and that new possibilities for production now are open particularly in the old higher part of the area.

Deep sand development at Refugio on the east side resulted in the addition of another small well in the 6,400-foot sand. This was Houston Oil Co.'s No. 1 Jeter, Block 59, of the townlots, which is flowing 50 bbls. of 60 gravity (corrected for temperature) oil on a quarter-inch choke from the sand at 6,441-55 feet. Working pressure of the well is 2,250 pounds and temperature 40 degrees.

Some interest has been centered in several possible wildcat extensions to the Refugio district. Over a mile south of the field, Moody-Seagraves Producing Co.'s No. 1-A St. John is in a sand at 5,491-5,500 feet. Twenty-three feet of screen was set in the sand and the well started flowing through tubing but sanded. Losing the swab in the hole, operators now are pulling tubing.

More than 2 miles to the northeast of the main field, Houston Oil Co.'s No. 1 O'Connor is in sand showing oil at 5,913 feet. A drill stem test a few feet higher tested a slight show and the hole is being deepened a little. This test is about a mile southeast of the district opened early this year by Union Producing Co.'s No. 1 M. F. Lambert. So far the latter well and Houston Oil Co.'s No. 2 Rose Lambert have been the only commercial completions there.

Independent Oil & Gas Co. has abandoned its effort to find a deep sand in its No. 6 Jerry Reilly. This test, which at a total depth of 7,618 feet, is the deepest ever drilled in the Refugio district, is being plugged back to 3,860 feet to the shallow sand where it made a small well originally. Considering the location of this well at one of the highest parts and in the center of the Refugio district it has been looked upon as one of the most important tests. Previous deep drilling has been chiefly on the sides of the original 3,700-foot field. This well encountered several deep sands but these tested salt water.

Very little new work is being started at Refugio at this time but drilling is showing no let-up due to the fact that work is being centered chiefly on deepening of former wells to lower sands. The proving up of the newer 6,400-foot sand throughout the eastern side of the district is causing operators to go back into their 5,500 and 5,700-foot wells for deepening.

In Esperson Field

In the Esperson Field of western Liberty County, Cranfill-Reynolds Co. completed a small extension well in its No. 5 Moores Bluff flowing 125 bbls. daily with 160 feet of screen set at 2,323 feet. The well is flowing through a three-eighths-inch choke. This company's No. 13 Esperson, a former producer, which was sidetracked and drilled back to sand at 3,323 feet, was put on the pump for 150 bbls.

Other completions of the week were Warner Quinlan's No. 1 Minchen in the new district on the northwest side of the Pierce Junction Dome, flowing 265 bbls. from sand at 4,136 feet, and Gulf Refining Co.'s No. 25 Lutcher-Moore, Starks, Calcasieu Parish, pumping 30 bbls. of fluid, 10 per cent b.s. and water at 1,228 feet.

Pure Oil Co. and Rycade Oil Corp. have abandoned their Oyster Bayou wildcat, located in the Robert Oliver Survey, southern Chambers County. Oyster Bayou is one of the newer geophysical salt dome prospects and about 6 miles west of High Island. The test, drilled to 6,320 feet, was the first drilled on the prospect. It was quit in sandy shale and lime and revealed no oil showings.

Humble Oil & Refining Co. during the week made selection of a reported 2,500 acres at $10 an acre out of the adjoining McFaddin and White ranches in southern Jefferson County. This selection follows recent geophysical exploration of these ranches, where a new salt dome is said to have been indicated.

Daily Average Production

Production of Coastal fields continued virtually unchanged for the week ended October 11. The daily average for the week was 190,031 bbls. Figures by fields were:

SOUTHEAST TEXAS

Allen	544
Barbers Hill	20,552
Batson	1,111
Big Creek	3,925
Blue Ridge	1,940
Brenham	135
Boling	965
Clay Creek	3,180
Damon Mound	695
DeWalt	11,934
Fannett	672
Goose Creek	4,597
Hankamer	1,580
High Island	926
Hull	7,395
Humble	14,940
Jasper County	25
Lost Lake	533
Markham	212
Moss Bluff	130
Mykawa	197
Nash	316
North Dayton	1,465
Orange	2,152
Orchard	1,886
Pierce Junction	11,077
Port Neches	1,401
Raccoon Bend	10,342
Refugio	27,392
Esperson (Sheeks)	3,241
Saratoga	1,336
Sour Lake	2,244
South Liberty	3,216
Spindletop	15,914
West Columbia	4,115
Total Southeast Texas	162,199
Total Week ending October 4	160,581
Increase	1,618

SOUTH LOUISIANA

Anse La Butte	32
Bayou Blue	37
Bayou Bouillon	146
Black Bayou	326
Edgerly	442
Jennings	2,077
Hackberry	3,387
Lake Barre	1,020
Lake Pelto	97
Lockport	2,682
Port Barre	3,406
Sorrento	65
Starks	696
Sulphur	2,475
Sweet Lake	1,149
Vinton	8,618
Welsh	113
White Castle	1,070
Total South Louisiana	27,832
Week ending October 4	27,957
Decrease	125
Total Gulf Coast	190,031
Week ending October 4	188,538
Increase	1,493

GULF COAST FIELDS AND WILDCATS

Week Ended October 11

BARBERS HILL—CHAMBERS COUNTY

Mills Bennett Prod. Co.'s No. 4 Gulf-Higgins, southwest	To pump 5,286 ft.
Mills Bennett Prod. Co.'s No. 2 Means (workover)	Drlg. hard sandy shale 5,197 ft.
Humble Oil & Ref. Co.'s No. 6 fee, west	Drlg. sand and shale 6,527 ft.
Humphreys Corp.'s No. 1 Fitzgerald, north	Drlg. oil sand 5,342 ft.
Humphreys Corp.'s No. 1-B Barber, north	Drlg. shale and lime 5,746 ft.
Humphreys Corp.'s No. 6-A Barber, northwest	Fishing core barrel 5,015 ft.
Humphreys Corp.'s No. 8-B Kirby, northwest	Shale and lime 2,794 ft.; sidetracking 2,438 ft.
Humphreys Corp.'s No. 10-A Kirby (workover)	Rig.
Humphreys Corp.'s No. 2-H Kirby (workover)	Rig up to pump 5,304 ft.
Humphreys Corp.'s No. 2 Scott (workover)	Abandoned in shale 7,697 ft.
Humphreys Corp.'s No. 1 Winfree, west	Drlg. lime rock 3,095 ft.
McAlbert Oil Co.'s No. 1 Higgins (workover)	To pump 5,324 ft.
McAlbert Oil Co.'s No. 1-B Higgins, east	Drlg. rock 2,012 ft.
McAlbert Oil Co.'s No. 5 Woodward (workover)	Comp. pumping 156 bbls. 5,249 ft.
Republic Prod. Co.'s No. 3 Kirby (workover)	Drlg. shale 6,661 ft.
Rio Bravo Oil Co.'s No. 1 Fisher, southwest	Drlg. hard sandy lime 6,334 ft.
Sinclair Oil & Gas Co.'s No. 1 Smith, west	Drlg. lime rock 5,060 ft.
Sinclair Oil & Gas Co.'s No. 2 Smith, west	Drlg. lime rock 3,292 ft.
Sinclair Oil & Gas Co.'s No. 4 McKinney, southeast	Comp. flowing 15 bbls. 5,250 ft.
Sun Oil Co.'s No. 5 Chambers (workover)	Rig up to deepen 4,674 ft.
Sun Oil Co.'s No. 6 Chambers (workover)	Comp. flowing 1,320 bbls. 4,622 ft.
Sun Oil Co.'s No. 7 Chambers, south	Drlg. gumbo 253 ft.
Sun Oil Co.'s No. 11 Wilburn fee, southeast	To pump 3,455 ft.
Sun Oil Co.'s No. 12 Wilburn fee, east	Drlg. rock 1,876 ft.
Sun Oil Co.'s No. 1 Zadie Fisher, southwest	Drlg. shale 5,507 ft.
The Texas Company's No. 1 Williams, southwest	Drlg. hard shale 5,701 ft.
The Texas Company's No. 1 Winfree, west	Bailing 3,585 ft.
Yount Lee Oil Co.'s No. 1 Fisher (workover)	Comp. flowing 720 bbls. fluid, 30% water, 6,700 ft.
Yount Lee Oil Co.'s No. 1 Hindman, southwest	Drlg. shale and lime 6,200 ft.
Yount Lee Oil Co.'s No. 16 Chambers, south	Drlg. shale, lime and salt 2,485 ft.
Yount Lee Oil Co.'s No. 3 Fisher, southeast	Drlg. hard sand 6,604 ft.
Yount Lee Oil Co.'s No. 5 Phillips, southwest	Set 8⅝ joints screen; comp. flowing 1,050 bbls. 5,231 ft.
Yount Lee Oil Co.'s No. 9 Woodward, southeast	Oil sand 5,007 ft.; set 5 joints screen 5,069 ft.

RACCOON BEND—AUSTIN COUNTY

Humble & Valley's No. 2 Duncan-State	Shut down on account of high water 2,562 ft.
Humble & Valley's No. 3-B Hardy	Derrick.
Humble & Valley's No. 9 Mueller	Derrick.
Humble & Valley's No. 7 Payne	Derrick.
Humble & Valley's No. 8 Payne	Derrick.
Humble & Valley's No. 1-B Reese	Waiting on cement 191 ft.

(Continued on Page 116)

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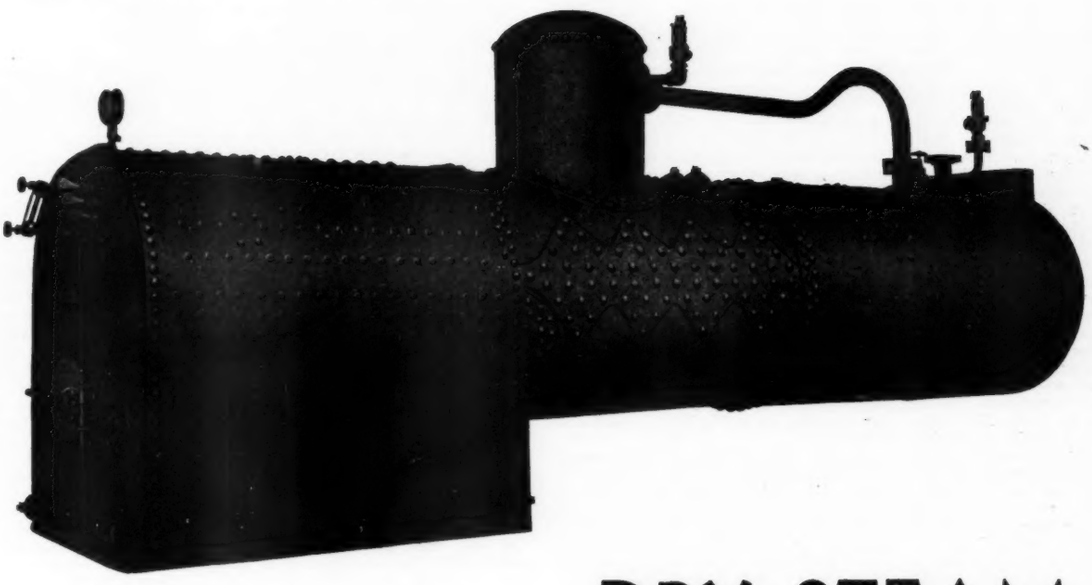

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Carterville Deep Test Abandoned. Surprise in Pine Island District. Semiwildcat Gasser in Richland Parish

By D. H. Bancroft
Staff Correspondent, Louisiana-Arkansas

SHREVEPORT, La., Oct. 13.—It is almost a year since the Zwolle district in Sabine Parish was opened, yet the best well, potentially, completed in the pool was brought in early this week, extending the proven area a mile and a half south. It was Pelican Natural Gas Co.'s No. 4 Sabine Lumber Co. in the NE cor. NW NE Section 11-7-12. At a total depth of 2,354 feet, in the so-called Zwolle marl, which has not yet been satisfactorily identified, but which corresponds with the shallow pay in the north extension of the pool, the well started flowing at the rate of 3,168 bbls. daily through a quarter-inch choke. What it would do wide open has been estimated as high as 15,000 to 20,000 bbls. per day. But it never will do that. It might be opened and flow at that rate for a few hours and that would be the end of it. After that it would probably drop to a small pumper, for there is not enough gas to make any well in the field flow very long wide open. Two or three days after completion, flowing through a one-eighth inch choke under 308 pounds working pressure, it was doing 60 bbls. an hour. The previous farthest south well in the field is a mile north and 2 miles west, the new well giving Zwolle Pool proper an extreme width of 2½ miles north and south and 4 miles east and west with two wildcat producers still another 4 miles east.

There were several other important, or significant, perhaps, completions in the Zwolle district. R. L. Gay's No. 5 Sabine Lumber Co. in the NE cor. SE NE Section 15-7-14, a mile and a half northwest of Blue Lake production, tested salt water at 2,723 feet and was abandoned about 200 feet below where production in that area is coming from. Loring Oil Co.'s No. 1 Trammell, SW NW Section 4-7-11, a quarter mile or so northwest of the two previous big completions in the so-called "east extension" of Zwolle, was completed at 2,400 feet flowing 30 bbls. through tubing. In the north extension Lanier & Tarver's No. 1 Newton, NW SW Section 25-8-12, reported as a 1,000-bbl. initial producer stretching production to the east, finally settled down to 150 bbls., total depth 2,433 feet.

Shallow Pay Spotty

In Section 26-8-12, Loring Oil Co.'s No. 1 Schull, in the NW SW Section 26-8-12, was a dry hole at 2,643 feet after failing to get shallow production around 2,400 feet. This well, like its predecessor in the opposite corner of the "forty," is a dry south offset to a producer in the same horizon, which would seem to indicate that the shallow pay is going to be just as undependable or as treacherous—spotty—as the deeper 2,600-foot in the main body of the pool. The Texas Company's No. 1 Stille, in the SE SW Section 33-8-11, a half mile north of production in the extreme east end of Zwolle, was dry and abandoned at 2,515 feet, having missed or tested dry in the shallow pay as well as the original Zwolle horizon. At the latter depth it would seem to indicate that the structure doesn't extend as far north as geological surveys promised.

Half way between this well and the producers in Section 4-7-11, C. D. Neff, Trustee's No. 1-A Turner in the NE NW Section 4-7-11 is drilling at 2,440 feet with not mention of anything having been found that would warrant running testing tools. Arkansas Fuel Oil Co., missing the shallow pay with No. 1 Russell in the NW NE Section 26-8-12, until lately the farthest north well in the field, tested dry at 2,461 feet, drilled to 2,600 feet and is arranging for another test. Its No. 14 Logan, Section 33-10-12, Pleasant Hill district of Sabine, was completed at 3,230 feet pumping 10 bbls. Loring Oil Co.'s No. 12 Bowman-Hicks, SE NE Section 33-8-12, in Zwolle proven area, shot with 600 quarts at 2,556-2,650 feet, is waiting for pumping rig and will be a small producer.

Location for a wildcat, three-quarters of a mile northeast of The Texas Company's dry hole on the Stille land in Section 33-8-11, was made by Merritt and others on the Louisiana Long Leaf Lumber Co. land. For some reason or other, wildcatters are strangely attracted to territory in that direction from Zwolle production toward the shows in Natchitoches Parish wildcats, though there are plenty of dry holes to discourage them. Their program is to go below levels at which these prior tests were abandoned.

The Texas Company abandoned No. 14 Wilkinson, its Carterville deep test in Section 36-23-12, Bossier Parish, as a salt water hole at 4,058 feet after a drill stem test of sandy lime and shale at 4,018-24 feet failed to develop anything. No. 1 Pine Woods, Section 25-23-12, is arranging to run testing tool to find out what 3 feet of sand, 2,938-41 feet, may hold. Autrey Oil Co.'s No. 1 McDade in Section 28-19-11, a deep test on the southeast flank of Bellevue Dome, seeking production developed by similar tests of H. I. Morgan and others, had 18 thribles of salt water from 2,606 feet and is not looking so good. It already is far beyond the upper Trinity series from which Morgan's three wells produced.

A. C. Glassell's No. 1 Pittsfield plantation, in Section 41-8-10, Concordia Parish, listed as a 3,000,000-foot gas well with lots of salt water at 1,491 feet, recemented bottom, drilled out, duplicated the test and is arranging to go deeper. Louisiana Gas & Fuel Co. is doing the work. Returning to Bossier Parish activities for the moment, Woodley Petroleum Co. completed No. 1 Harris, NE NE, Section 14-17-12, Sligo gas district, which made 4,000,000 feet from the Second sand at 2,468 feet. No. 2 is an offset drilling below 200 feet with surface string cemented at 110 feet.

Daily Average Runs

Daily average runs from the field dropped 380 bbls. to a total of 92,680 bbls., a decline of 650 bbls. in Urbana being the most abrupt any pool in this division has shown in years. Louisiana runs of 40,275 bbls. showed an increase of 365 bbls. thanks largely to Pelican Natural Gas Co.'s extension well which boosted Zwolle shipments 785 bbls. over last week's average. Haynesville, under repressuring, added another 160 bbls. daily to the increase recorded last week and the week before. Caddo light fell off 270 bbls., Sarepta-Carterville 305 bbls. and in Arkansas Champagnolle was 120 bbls. under last week's average and Urbana 650 bbls. less than the week before, as stated. There were small gains in a majority of the pools in both divisions of the territory but declines of about the same degree maintained an approximate balance and it was the major differences referred to that caused the increase.

Daily average runs from the several pools were:

NORTH LOUISIANA	
Caddo, light	8,700
Caddo, heavy	2,765
Homer	3,465
Haynesville	5,060
DeSoto-Red River	3,040
Elm Grove	535
Bellevue	670
Cotton Valley	1,985
Urania	5,245
Pleasant Hill	485
Sarepta-Carterville	2,220
Zwolle	5,260
Holly	945
Total	40,275
Last week	39,910
Increase	365
ARKANSAS	
El Dorado	4,085
Smackover, light	4,975
Smackover, heavy	36,410
Stephens	900
Nevada County	1,040
Lisbon	880
Champagnolle	3,625
Bradley	65
Mount Holly	75
Urbana	350
Total	52,405
Last week	53,150
Decrease	745
Both states	92,680
Last week	93,060
Decrease	380

Pine Island Surprise

Shreveport Oil Corp.'s No. 1-A Muslow surprised everyone by blowing in from 2,126 feet with an estimated 5,000,000 feet of gas and 3,000 bbls. of salt water. It is in the NW NW, Section 32-21-15, Pine Island district, and the surprise is that there is enough gas in that area to make it possible for any well in either of the several sands to blow in like this one did. Since the "explosion" they have mudded off the gas and set 4½-inch to go deeper. L. B. Mawk's No. 1 Swan, a wildcat in Section 23-21-14, has been dropped from the report as abandoned at 700 feet. It had been standing there for the past five or six months. Louisiana Gas & Fuel Co., while revamping A. C. Glassell's No. 1 Pittsfield, has abandoned No. 1-A Tensas Delta in Section 23-6-5, Catahoula Parish, as a dry hole at 2,830 feet. El Dorado Chief Oil Co.'s No. 1 Dance, Section 27-20-7, Cla-

(Continued on Page 128)

WILDCAT OPERATIONS IN LOUISIANA-ARKANSAS

NORTH LOUISIANA

AVOYELLES PARISH

Company, farm location— Remarks—

Gas-Con Oil Corp.'s No. 1 Morrow (no check), Sec. 14-2s-4e ..... Drlg. gumbo 2,530 ft.

R. E. Tippett's No. 1 Chateline, NE NE, Sec. 34-1n-3e.... Cored S.W. sand 3,140-47 ft; S.D. 3,410 ft.

BIENVILLE PARISH

Carter & Dobbs' No. 1 White, 330 ft. N, 330 ft. W, SE cor. SE SE, Sec. 9-18-6 ..... S.D. 1,690 ft.

W. A. Nichols et al's No. 1 McDermott, 660 ft. S, 660 ft W, NE cor. NE NE, Sec. 28-18-6 ..... Drlg. chalk 2,520 ft.

S. P. Borden's No. 1 Thomas, 330 ft. S, 330 ft. E, NW cor. Sec. 27-16-9 ..... Cored lime 3,810 ft.

Olds & Smith's No. 1 Brice, 330 ft. N, 330 ft. E, SW cor. SE SE, Sec. 15-18-6 ..... S.D. 1,790 ft.

BOSSIER PARISH

Andrews & Davlin's No. 1 Nattin, 100 ft. N, 250 ft. W, C, Sec. 15-22-14 ..... Fishing baller; T. D. 1,510 ft.

Autrey Oil Co.'s No. 1 Johnson, 1,120 ft. N, 200 ft. E, SW cor. NW, Sec. 34-19-11 ..... Drlg. hard lime 2,577 ft.

Autrey Oil Co.'s No. 1 McDade, 200 ft. S, 200 ft. E, C, Sec. 28-19-11 ..... Cored broken anhydrite 2,424 ft.

CADDO PARISH

Tex.-La. Prod. Co.'s No. 1 French, 1,270 ft. N, 675 ft. E, SW cor. NW, Sec. 34-23-16 ..... Began drlg. Oct. 7; drlg. 370 ft.

Tex.-La. Prod. Co.'s No. 1 Wall, 2,715 ft. N, 1,980 ft. W, SE. cor., Sec. 33-23-16 ..... Rig up.

CALDWELL PARISH

Hudson et al's No. 1 Burton, Sec. 35-12-2e ..... S.D. 1,672 ft; S.W. sand.

CATAHOULA PARISH

National Drlg. Co.'s No. 1 Marsh McMiller, 70 ft. N, 100 ft. W, C, Sec. 26-9-6 ..... Rig up.

CLAIBORNE PARISH

Baird Bros. et al's No. 1 Whittaker, 600 ft. N, 400 ft. W, SE cor. NE, Sec. 30-20-7 ..... S.D. 2,200 ft.

Baugh et al's No. 1 Alexander, 330 ft. S, 330 ft. W, NE cor., Sec. 27-20-8 ..... S.D. 2,200 ft.

(Continued on Page 114)

LOUISIANA-ARKANSAS PROVEN AREAS

NORTH LOUISIANA

BOSSIER PARISH—BELLEVUE

Company, farm and location— Remarks—

La. Oil Ref. Corp.'s No. 13-B Bodcaw, 330 ft. S, 400 ft. W, NE cor. SE SW, Sec. 11-19-11 ..... Began drlg. Oct. 2; cmtd. 10-in. 200 ft; drlg. 1,000 ft.

H. I. Morgan's No. 6-B Weatherbee, 200 ft. N, 200 ft. E, SW cor. SE NW, Sec. 22-19-11 ..... Coring lime 1,650 ft.

BOSSIER PARISH—CARTERVILLE

Del.-La. Dev. Co.'s No. 6 Bollinger, 330 ft. S, 220 ft. W, NW cor., Lot 17, in Lot 16, Sec. 31-23-11 ..... Hole full oil; W.O.S.R.; 15 ft. broken sand. Total depth 3,217 ft.

Greenwood Prod. Co.'s No. 2 Bollinger, 990 ft. W, 330 ft. S, NE cor. NE SE, Sec. 36-23-12 ..... Cmtd. 6⅝-in. 3,138 ft. 5-ft. sand; W.O.S.R. 3,173 ft.

Palmer Corp.'s No. 2 Roberson, 330 ft. N, 330 ft. E, SW cor. NW NE, Sec. 26-23-12 ..... Derrick.

The Texas Co.'s No. 1 Pine Woods Lbr. Co., 1,650 ft. S, 300 ft. E, NW cor., Sec. 25-23-12 ..... Estimated 2,000,000 ft. gas 2,694 ft; arranging to test 3-ft. sand showing oil 2,938-41 ft.

The Texas Co.'s No. 16 Wilkinson, 330 ft. N, 330 ft. E, SW NE, Sec. 36-23-12 ..... Rig up.

Tippett Drlg. Co.'s No. 3 Holmes, 330 ft. N, 330 ft. E, SW cor. NE NW, Sec. 36-23-12 ..... 300 ft. oil in hole; waiting on power; T.D. 3,180 ft.

BOSSIER PARISH—ELM GROVE

R. O. Roy's No. 1 Hunter, 660 ft. N, 660 ft. E, SW cor., Sec. 24-16-11 ..... Cmtd. 10-in. 309 ft.

Woodley Pet. Co.'s No. 2 Harris, 247 ft. E, 800 ft. S, NW cor. NE NE, Sec. 14-17-12 ..... Began drlg. Oct. 7; cmtd. 10-in. 112 ft.

BOSSIER PARISH—SLIGO

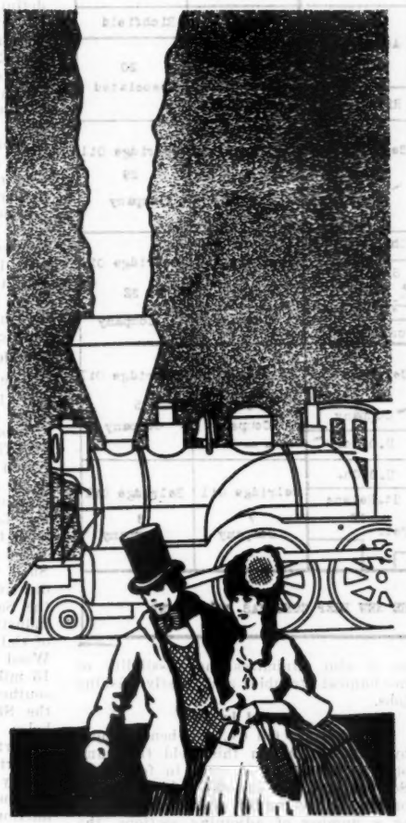
La. G. & F. Co.'s No. 1 Jeter, 4,650 ft. W, 660 ft. S, NE cor., Sec. 24-17-12 ..... Rig up.

La. G. & F. Co.'s No. 1 Webb, 4,650 ft. W, 660 ft. S, NE cor., Sec. 24-17-12 ..... Drlg. 1,762 ft.

(Continued on Page 115)

We knew them...

when they were villages



A FEW years ago they were flag stations on the railroad. There were no model highways in and out of them; the "natives" cooked with wood and heated their homes with the same fuel; the local paper was read under a coal oil lamp that stood in the center of a great round table; and the children got their school lessons by the same dim light.

The model highschool yonder stands on land that was then out in the country. That industrial plant rises from the lot that we refused at two hundred dollars. That stretch of wonderful street paving lined with beautiful homes heated with Natural Gas was an unpromising dirt street.

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Belridge Temblor Production Proved

Most Important Discovery in California Since Kettleman Hills. Well Flows 2,750 Bbls. of 46.2 Gravity

By L. P. Stockman
Staff Correspondent, California Fields

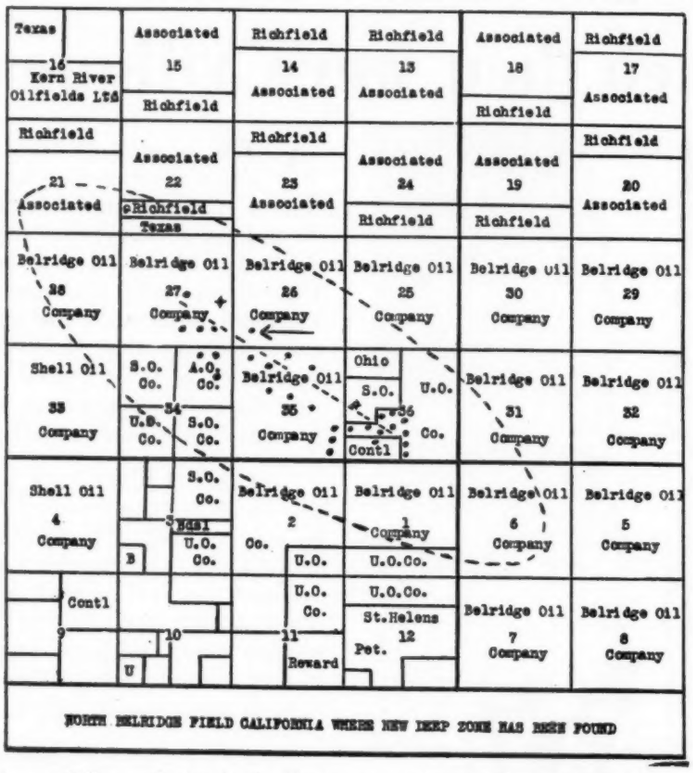
LOS ANGELES, Calif., Oct. 11.—The most important development in California this week was the recompletion of the Belridge Oil Co.'s well No. 15 in the North Belridge Field of Kern County flowing 2,750 bbls. of exceptionally clean 46.2 gravity oil and 55,000,000 feet of natural gas per day from 5,457 feet. The significance which attaches to the completion of this well lies in the fact that it definitely proves up the existence of prolific Temblor production in the North Belridge Field and indicates the probable existence of a similar productive formation in the Lost Hills, South Belridge and other adjacent fields. The North Belridge Field is located 5 miles northwest of the South Belridge Field, 6 miles southwest of Lost Hills and approximately 40 miles west and a little north of the city of Bakersfield in Kern County.

The Belridge Oil Co.'s No. 15, located in SW cor. of Section 26-27-20, was given a preliminary production test April 24, 1930, at which time it registered an initial of approximately 100 bbls. of clean 57.1 gravity oil and 3,700,000 feet of natural gas per day from 5,088 feet. The well at that time was flowing through a 1½-inch bean under a pressure of 410 pounds on the tubing and 600 pounds on the casing. The failure to develop substantial production subsequently prompted the company to take in a little more sand with the result that it was recompleted October 7, 1930, as a substantial produced. It is flowing through 4½-inch beans at the present time and has a penetration in the Temblor of 492 feet, these rocks being picked up at 4,965 feet. The present pipe record lists a string of 6⅝-inch casing landed at 4,934 feet and 581 feet of 4¾-inch liner carrying 497 feet of 120 mesh screen. This well might have shown a substantially larger production if it could have been finished in perfect condition mechanically. The company was unable to recover the 86 feet of 4¾-inch liner which was landed in the original production test at 5,088 feet and was obliged to sidetrack it. A little later on a string of drill pipe twisted off while the crew was rotating ahead at 5,400 feet and the company was also obliged to sidetrack this fish. This series of fishing jobs retarded completion for several months but the well was subsequently brought in as a commercial producer early this week flowing under a pressure of 805 pounds on the tubing and 1,650 pounds on the casing.

Closely Held

Completion of the Belridge Oil Co.'s new well is not expected to precipitate competitive drilling in the North Belridge Field due to the fact that all of the acreage involved is held in relatively large blocks. Producitve limits of the upper zone in this field are quite limited with the trend of the structure extending from northwest to southeast across Sections 27, 35 and 36. The SW cor. of Section 26 and NE cor. of Section 34 were also productive in the upper zone. It is conjectural, however, whether the underlying Temblor will be comformable with the upper sand or whether the productive limits of the deeper zone will be larger in scope. It is interesting to note in this connection that the Richfield Oil Co.'s drilling project in Section 27-27-20, located approximately 1 mile northwest of the Belridge Oil Co.'s new deep zone discovery, encountered the top of the Temblor approximately 20 feet higher than it was logged in the latter project. This tends to indicate that the lower zone will be considerably larger in area than the upper horizon as the Richfield's new well is more than 2,000 feet beyond the limits of present production.

It is improbable that Temblor production in the North Belridge Field of Kern County will prove as an important factor as similar production in the North Dome of Kettleman Hills. The probable productive limits at North Belridge may cover several square miles but this field is expected to be of secondary importance in comparison with Kettleman Hills where production has already been proven for a distance of approximately 11 miles along the axis of the structure. It has one very important advantage over Kettleman Hills, however, in that the top of the productive Temblor is picked up at a considerably shallower depth. This will result in considerably lower drilling costs and much faster drilling time. This advantage should prove a very important factor from a drilling standpoint as it also minimizes the possibility of mechanical trouble and costly fishing jobs.



NORTH BELRIDGE FIELD CALIFORNIA WHERE NEW DEEP ZONE HAS BEEN FOUND

Owned in Fee

The Belridge Oil Co. will benefit more by its discovery in this field than any other company as it owns in fee all of Sections 26, 27 and 35, which are at present proven up for production, as well as a number of adjoining sections, the productive status of which is at present undetermined. As each section comprises 640 acres, the Belridge Oil Co. therefore has approximately 2,000 acres of proven oil land. The Union Oil Co. owns in fee and controls under lease 380 acres in Section 36-27-20, which are at present productive in the upper zone, in addition to several hundred acres of possibily productive acreage spotted around the edge of the field. The Associated Oil Co., which controls several thousand acres in this section of the State, has 160 acres in the NE cor. of Section 34 which is definitely proven up for production in as much as this property adjoins the holdings of the Belridge Oil Co. in Section 26, on which the company's deep zone discovery is located. It is not at all improbable that some of the additional holdings of the Associated may ultimately be proven productive but this will not be definitely determined until additional data is available under actual drilling conditions. If the Richfield Oil Co.'s driller in Section 22-27-20 results in commercial production this will automatically prove up acreage of the Associated in Sections 21 and 22 and other adjacent holdings. The Continental, Standard, Ohio, Barnsdall, St. Helens Petroleum and a number of other companies also hold proven and possibly productive acreage in the North Belridge Field.

Most Important Since Kettleman

The development of substantial Temblor production in the North Belridge Field is the most important discovery in California since the Milham Exploration Co. finished its discovery well in the North Dome of the Kettleman Hills Field as it greatly enhances the possibility of developing similar production at Belridge and Lost Hills. This new find, together with the discovery of a new field in the Weed Patch area of Kern County by the Shell Oil Co. a few months ago, is indicative of the enormous potentiality of the San Joaquin Basin to which the oil industry must look for the greater part of California's future production. In the Weed Patch area, located approximately 15 miles southeast of Bakersfield in the southern end of the San Joaquin Basin, the Shell Oil Co. has started two new holes. Grades are being made for No. 1 Porter in Section 29-30-29 and No. 1 Wharton in Section 32-30-29. The discovery well, No. 1 Porter Day, is being deepened in the hope of stimulating production, drilling having been resumed early this week at 5,408 feet.

The Union Oil Co., which recently acquired a one-half undivided interest in the Amerada Petroleum Co.'s King lease in the Kettleman Hills Field of Kings County, stepped up into San Joaquin County this week and leased 5,801 acres of potential oil land in the Tracey Vernalis San Joaquin City area. This area, geologized by the company earlier this year, is located about 100 miles east of San Francisco and about 300 miles north of Los Angeles. Under the terms of this lease the Union will not be obliged to undertake exploration work until next summer. The Petroleum Securities Co. has abandoned its wildcat west of Huron in Fresno County, which it drilled to 7,390 feet, but simultaneously staked location for another test which will also be drilled in Section 28-20-16. The area being tested out by the Petroleum Securities is due east of the Coalinga Field of Fresno County and northwest of the Superior's No. 1 Huffman at Kettleman Hills. The Ohio has abandoned its No. 1 Welch in Section 8-21-15 as a duster at 4,970 feet. This well is located south of the Coalinga Field and southwest of the area being explored by the Petroleum Securities.

The Milham Exploration Co., discov-

TANKER SHIPMENTS FROM LOS ANGELES TO ATLANTIC AND GULF COAST PORTS

Commodity—	Total this week	Daily average	Total last week	Daily average	This year to date	Same time last year
Crude oil	.....	.....	.....	.....	68,690	997,250
Fue oil	.....	.....	.....	.....	71,950	457,175
Diesel and gas oil	.....	.....	.....	.....	2,592,518	1,635,047
Gasoline	407,208	58,173	346,160	79,451	15,118,901	15,749,130
Naphtha distillate	.....	.....	.....	.....	.....	81,750
Coastwise—						
Crude oil	162,000	23,143	542,014	77,431	12,031,233	21,209,967
Fuel oil	420,470	60,067	535,631	76,519	13,614,718	14,783,291
Diesel and gas oil	61,640	8,806	8,543	1,220	1,288,282	902,551
Gasoline	168,947	24,135	234,311	33,473	9,814,395	8,434,803
Kerosene	.....	.....	.....	.....	149,256	69,509
Exports—						
Crude oil	275,391	39,342	9,095	1,299	5,376,083	4,481,571
Fuel oil	295,424	42,203	400,586	57,227	14,045,673	13,966,314
Diesel and gas oil	147,404	21,058	106,844	15,263	3,546,209	2,060,773
Gasoline	453,464	64,781	279,918	39,988	12,532,663	9,023,843
Kerosene	62,809	8,973	8,443	1,206	2,984,674	2,445,606
Lubricants	12,754	1,822	.....	.....	27,434	.....

TANKER SHIPMENTS FROM SAN FRANCISCO TO ATLANTIC AND GULF COAST PORTS

Diesel and gas oil	.....	.....	.....	.....	279,088	.....
Gasoline	.....	.....	.....	.....	1,008,757	1,658,845
Lubricants	.....	.....	.....	.....	24,774	138,706
Coastwise—						
Fuel oil	112,102	16,015	56,510	8,073	2,656,866	2,353,488
Diesel and gas oil	69,510	9,930	.....	.....	275,766	359,055
Gasoline	140,395	21,342	192,025	27,432	3,340,994	3,981,686
Kerosene	1,499	214	1,180	169	179,426	131,944
Exports—						
Crude oil	56,918	8,131	.....	.....	59,993	121,603
Fuel oil	72,950	10,421	74,231	10,604	809,316	657,681
Diesel and gas oil	.....	.....	5,810	830	457,589	326,657
Gasoline	161,305	23,044	75,022	10,717	3,231,619	4,181,576
Kerosene	6,180	883	7,160	1,023	546,848	528,060
Lubricants	.....	.....	.....	.....	33,579	25,713

AMERICAN TANK *Says V and V!*

Eleven years ago American Tank and Equipment Corporation saw the advantages Oklahoma City offered the manufacturer of oil field supplies in location, transportation and labor supply . . . and moved its small plant here.

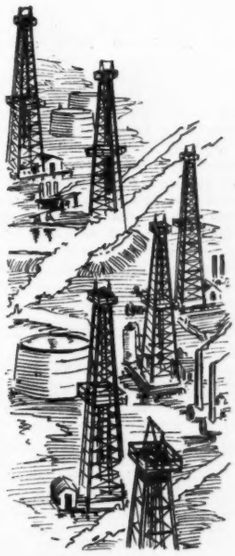
Ten years later, in 1929, this same firm decided to erect the most modern and best equipped welding plant in the Southwest. When Oklahoma City was suggested as a location American Tank said, "Check and Double Check".

Again location, transportation and labor supply were the prime factors in the selection of a site. And again Oklahoma Citv responded.

As for location, Oklahoma City is the very hub of the entire Mid-Continent Area. As for transportation, seven trunk line railroads converge at Oklahoma City and offer a service from seven hours to twenty-four quicker to any point in the Mid-Continent. As for labor supply, common and skilled labor alike are available and in addition, adequate and suitable housing facilities to care for this labor are plentiful.

There is dependable, economical electric power from the state's largest interconnected power plant and transmission lines available at attractive industrial rates.

The American Tank and Equipment Corporation is but one of many firms serving the oil industry that have found Oklahoma City the ideal point as a base of their operations in the Mid-Continent. Write for a list of the others and for additional information about Oklahoma City, the distributing center for the Mid-Continent and Oklahoma City, the City of Homes and Homefolks.



OKLAHOMA CITY CHAMBER of COMMERCE

OKLAHOMA CITY, OKLAHOMA

erer of the North Dome at Kettleman Hills and the Buttonwillow gas field, has suspended production of natural gas in the latter area and will offset its gas deliveries to the Pacific Gas & Electric Co. by making an additional delivery at Kettleman Hills. For the past several months the Milham has been delivering approximately 15,000,000 feet of dry natural gas to the Pacific Gas & Electric Co. at Buttonwillow. The discontinuance of this practice in the interests of conservation will permit the utilization of a similar quantity of natural gas produced at Kettleman Hills. It is interesting to note in this connection that approximately 400,000,000 feet of natural gas is being blown to the air at Kettleman Hills every day. This represents more than twice the amount of wastage in all other fields of the State.

The State Department of Natural Resources, taking cognizance of this condition, is concentrating its efforts toward enforcing the gas conservation law at Kettleman Hills. The hearing on injunction proceedings instituted by the State Department of Natural Resources to prevent further wastage of natural gas at Kettleman Hills, got under way before Judge S. L. Strother at Hanford October 6. It will probably be another several weeks before any decision can be reached as the legality of the gas conservation law will be argued upon conclusion of the usual arguments on demurrers. The attempt of the State Department of Natural Resources to apply the gas conservation law to Kettleman Hills is particularly interesting because of the efforts of operators to agree upon a definite form of unit development, through the operation of which future wastes will be minimized. This test case is extremely important, however, because of the development of similar prolific Temblor production at North Belridge and the probable existence of similar productive rocks in the South Belridge and Lost Hills Fields.

During the month of July a total of $161,614 was distributed on a prorata basis to operators having completed but unproductive wells in the North Dome at Kettleman Hills. A total of 24 wells suspended above the pay in conformity with the Kettleman Hills agreement, which contemplates curtailment until July, 1931, participated in the July disbursement. Provision was also made in the July settlement for the amount due the Bolsa Chica Oil Co. on a retroactive basis, which approximated $27,545. The $161,614 distributed during July represents 25 per cent of the monetary value of oil sold and produced during that period. The total value therefore approximated $646,458, which was furnished by three producing companies whose wells are allowed to produce in conformity with the curtailment agreement. The 25 per cent of gross receipts disbursed to participating members was decided upon several months ago and represents an arbitrary fixed drainage factor. Of the amount distributed during July, Continental Oil Co. contributed 98,514 bbls., Milham Exploration Co., 55,992 bbls., and Standard Oil Co., 164,752 bbls. In addition to this total, the Standard voluntarily contributed 72,528 bbls. produced by its well No. 38, bringing the total oil involved to 391,793 bbls., the gross value of which was $646,458.

No final decision has yet been reached with regard to the unification of development work at Kettleman Hills but an early favorable settlement is anticipated. The inability of operators to agree upon a definite basis of development has probably been misconstrued by many unfamiliar with the vast amount of detail work involved which covers not only the legal aspect of the situation but the actual mechanics of operation. In view of the fact that billions of dollars are involved and the future stability of the industry affected, progress must necessarily be somewhat rather slow. William Reinhardt, vice president of the Shell Oil Co. and chairman of the Kettleman Hills committee on unit development, stated yesterday that, "there has been more definite progress made now in the matter of a unit plan for the North Dome than at any time in the past. The plan, however, which has already been revised three times, is still subject to revision. While I cannot say that all the operators are agreed to it, I feel that the majority of those interested are decidedly in favor of it as it stands. But there are some reservations and these must be ironed out." The unit plan of development as it stands at the present time contemplates the drilling of one well for every 20 acres, as compared with the original tentative proposal of one well to every 10 acres and another proposal involving one well to every 30 acres, which did not meet with approval.

Playa Del Rey

There were several good wells finished in the Playa Del Rey Field of Los Angeles Basin during the past week, as far as initial production is concerned. The Mohawk Oil Co. topped the list by finishing two wells, one of which was the largest completion registered during the period in question. This was No. 1 Tuttle at Thirty-third and Pacific Avenue, which, upon completion, showed an initial of 2,425 bbls. of 24.1 gravity oil and 1,500,000 feet of natural gas per day. This new well blew in barefoot from 6,450 feet. The Mohawk's other current completion was well No. 1 on Lease I, which was returned to production doing 1,140 bbls. of 23.1 gravity oil per day after being redrilled and deepened from 5,729 feet to 5,835 feet. The Barnsdall Oil Co. finished No. 13 Burks, a new well in the southern part of this lease late in the week flowing 745 bbls. per day from the upper zone at 4,530 feet, the hole having been completed with a 6⅝-inch liner carrying 1,092 feet of perforated.

The Union Oil Co. put its No. 3 Townsite on a preliminary production test several days ago but was forced to subsequently kill it because a satisfactory water shutoff had not been effected. The Toy Petroleum Co. successfully finished its initial producer in the Playa Del Rey Field when No. 1 Venice was brought in flowing 7,000,000 feet of natural gas and 250 bbls. of oil per day from 4,206 feet, the hole having been finished with a 5-inch liner carrying 745 feet of perforated. The unusually large amount of gas being produced by this well has obviously reduced the production of crude oil but it is logical to assume that the amount of oil produced will increase as the flow of gas diminishes. Cory & Randall successfully recompleted their No. 1 Venice flowing 1,250 bbls. of 22.6 gravity oil per day after cleaning out the hole to bottom, 6,219 feet. This well, drilled by J. L. Clarke, registered a preliminary flow late last week. The Ohio Oil Co. added a new well to its list of producers in this field when No. 3 Recreation, bottomed at 4,022 feet and finished with a 6⅝-inch liner carrying 613 feet of perforated, was brought in under a natural flow doing 1,088 bbls. of exceptionally clean 25.6 gravity oil and 700,000 feet of natural gas per day. The Pacific Western Oil Co., which recently completed its No. 1 Stanley at 5,961 feet, killed the well early this week and will add a little more hole in the hope of stimulating production. The Altadena Oil Co. also killed a recent completion in this field as water has broken in and will require another cement job.

Long Beach

The Shell Oil Co., after concluding its development program in the Long Beach Field a year or so ago, has found it necessary to undertake the drilling of sev-

(Continued on Page 123)

IMPORTANT NORTHERN CALIFORNIA WILDCATS

Company, well and location—	S.T.R.	Depth	Status
Standard, No. 1 Point Conception, Santa Barbara Co.	X- 5-34	6,451	hd. sd. drilling
Universal, No. 1 Pt. Conception, Santa Barbara Co.	30- 5-34	5,060	abandoned
Prairie Oil Co., No. 1 Lompoc, Santa Barbara Co.	15- 7-35	5,625	hd. sd. drilling
Fields Gas Co., No. 1 Santa Maria, Santa Barbara Co.	8- 9-33	5,500	sd. sh. drilling
Western Gulf, No. 1 Santa Maria, Santa Barbara Co.	5- 9-33	3,594	sd. sh. drilling
Barnsdall, No. 1 Gato Ridge, Santa Barbara Co.	9- 8-32	4,630	sd. sh. drilling
Midwest Oil Co., No. 1 Los Alamos, Santa Barbara Co.	2- 7-33	1,010	sd. sh. drilling
General Pet., No. 1 Goleta, Santa Barbara Co.	21- 4-28	4,533	shut in
General Pet., No. 2 Goleta, Santa Barbara Co.	21- 4-28	4,350	suspended
General Pet., No. 3 Goleta, Santa Barbara Co.	21- 4-28	2,401	sd. sh. drilling
General Pet., No. 134 Goleta, Santa Barbara Co.	21- 4-28	1,485	suspended
General Pet., No. 136 Goleta, Santa Barbara Co.	21- 4-28	1,016	suspended
General Pet., No. 137 Goleta, Santa Barbara Co.	21- 4-28	1,026	suspended
General Pet., No. 138 Goleta, Santa Barbara Co.	21- 4-28	4,931	suspended
General Pet., No. 139 Goleta, Santa Barbara Co.	21- 4-28	1,035	suspended
General Pet., No. 143 Goleta, Santa Barbara Co.	21- 4-28	1,040	suspended
Boles Oil Co., No. 140 Goleta, Santa Barbara Co.	22- 4-28	1,040	suspended
U. S. Pet., No. 141 Goleta, Santa Barbara Co.	20- 4-28	1,035	suspended
U. S. Pet., No. 142 Goleta, Santa Barbara Co.	20- 4-28	1,032	suspended
U. S. Pet., No. 143 Goleta, Santa Barbara Co.	20- 4-28	1,019	suspended
El Camino, No. 149 Goleta Tideland, Santa Barbara Co.	22- 4-28	1,035	suspended
Bolsa Chica, No. 191 Goleta, Santa Barbara Co.	24- 4-29	2,500	sd. sh. drilling
Caldwell Brown, No. 159 Goleta, Santa Barbara Co.	24- 4-29	1,040	suspended
Cochran, J. H., No. 1 Naples, Santa Barbara Co.	7- 4-29	3,794	suspended
Johnson, George, No. 1 Goleta, Santa Barbara Co.	X- 4-28	3,970	cleaning out
Wildcat Oil Co., No. 1 Santa Maria, Santa Barbara Co.	20-10-35	5,500	suspended
Pacific Western, No. 1 Gibraltar, Santa Barbara Co.	14- 5-27	2,345	suspended
Shell, No. 5 Oxnard, Ventura Co.	14- 2-20	3,360	cleaning out
Prairie Oil & Gas Co., No. 1 Ventura, Ventura Co.	30- 3-22	7,518	reaming
Rio Grande, No. 1 Lankershim, Ventura Co.	13- 4-19	2,000	redrilling
Associated, No. 1 Rincon Creek, Ventura Co.	19- 4-24	2,080	suspended
Pure Oil Co., No. 1 S. P. Canyon, Ventura Co.	15- 4-21	2,290	set pipe
California Republic, No. 1 Sespe, Ventura Co.	23- 4-21	rig	rigging up
Superior Oil Co., No. 1 Sespe, Ventura Co.	14- 4-21	1,300	sd. sh. drilling
Lockwood Valley Oil Co., well No. 1, Ventura Co.	32- 8-21	rig	suspended
Nordon Oil Co., No. 1-A Buttonwillow, Kern Co.	7-29-24	5,065	cleaning out
General Pet., No. 1 Belridge, Kern Co.	30-28-21	1,055	sd. sh. drilling
Belridge Oil Co., No. 1 Belridge, Kern Co.	26-27-20	5,457	flowing
Richfield, No. 1 Belridge, Kern Co.	20-27-20	5,070	reaming
Ohio Oil Co., No. 1 Belridge, Kern Co.	36-27-20	....	location
Rio Grande, No. 1 Belridge, Kern Co.	18-28-22	3,680	redrilling
Shell, No. 2 Belridge, Kern Co.	23-28-20	789	abandoned
Shell, No. 3 Belridge, Kern Co.	24-28-20	rig	core hole
Wallace, K. C., No. 1 Belridge, Kern Co.	32-29-21	3,785	hd. sd. drilling
Shell, No. 1 Weed Patch, Kern Co.	29-30-29	5,408	deepening
Shell, No. 2 Weed Patch, Kern Co.	32-30-29	....	grading
Petroleum Securities, No. 1 Edison, Kern Co.	14-29-29	3,580	redrilling
Symark Oil Co., No. 1 Edison, Kern Co.	24-29-29	2,130	suspended
Sayre, F. M., No. 1 Edison, Kern Co.	5-30-29	4,220	suspended
Standard, No. 1 Devils Den, Kern Co.	14-25-18	115	sd. drilling
Shell, No. 1 Semitropic, Kern Co.	17-27-23	6,560	hd. sd. drilling
Moran & DeCamp, No. 1 Mojave, Kern Co.	26-10-14	700	hd. sd. drilling
Meridian Oil Co., No. 1 Antelope, Kern Co.	11- 9-15	3,470	hd. sd. drilling
Bardeen, H. A., No. 1 San Emidio, Kern Co.	18-10-23	1,190	suspended
Bardeen, H. A., No. 2 San Emidio, Kern Co.	10-10-23	4,096	hd. sd. drilling
Stabler, W. W., No. 1 Commanche Pt., Kern Co.	4-11-18	2,040	suspended
Ritchie, J. J., No. 1 Tejon, Kern Co.	33-11-19	4,114	suspended
Wrenn, J., No. 1 Antelope Plains, Kern Co.	32-25-17	812	suspended
Ohio Oil Co., No. 1 Coalinga, Fresno Co.	8-21-15	4,970	abandoned
Associated, No. 1 Jacalitos, Fresno Co.	22-21-15	rig	rigging up
Petroleum Securities, No. 2 Huron, Fresno Co.	28-20-16	7,390	abandoned
Petroleum Securities, No. 3 Huron, Fresno Co.	28-20-16	....	location
Panorama Oil Co., well No. 1, San Luis Obispo Co.	7-31-21	4,019	suspended
Kent & McDonald, No. 1 Carizzo, San Luis Obispo Co.	3-32-22	1,315	suspended
Latin American Pet., No. 1 Shandon, San Luis Obispo Co.	31-27-15	4,525	suspended
Paso Robles Synd., No. 1 Creston, San Luis Obispo Co.	27-27-11	3,941	suspended
Continental, No. 1 San Miguel, San Luis Obispo Co.	26-25-11	mtl.	building rig
Schilling, C., No. 1 Atascadero, San Luis Obispo Co.	34-28-12	650	sd. sh. drilling
Pismo Dome Oil Co., No. 1 Edna, San Luis Obispo Co.	5-31-13	3,000	cleaning out
Standard, No. 1 King City, Monterey Co.	23-22- 7	5,600	hd. sd. drilling
O'Donnell, J. E., No. 1 Dudley Ridge, Kings Co.	7-23-20	1,635	gas well—idle
O'Donnell, J. E., No. 2 Dudley Ridge, Kings Co.	20-23-20	mtl.	building rig
Friend & Fiske, No. 1 Tulare Lake, Kings Co.	11-23-19	1,050	sd. sh. drilling
Knudsen & Smith, No. 1 Reef Ridge, Kings Co.	36-23-17	....	location
Penn Western, No. 1 Tulare Lake, Kings Co.	24-21-18	1,338	suspended
Wellport Oil Co., No. 1 Devils Den, Kings Co.	9-24-17	3,940	suspended
Twin State Oil Co., No. 1 Point Arena, Mendocino Co.	14-13-17	4,590	sd. sh. drilling
Oakdale Oil Co., No. 1 Oakdale, Stanislaus Co.	3- 2-10	3,585	suspended
Orinda Pet., well No. 1, Contra Costa Co.	32- 1- 3	720	hd. sd. drilling
White, Roy, No. 1 Pixley, Tulare Co.	8-23-26	4,495	suspended
Campbell Oil Co., No. 1 Porterville, Tulare Co.	22-22-27	850	cemented
Terra Bella Oil Co., No. 1 Porterville, Tulare Co.	35-22-27	918	pumping
Western Oil Co., No. 1 Porterville, Tulare Co.	35-22-27	1,022	testing
Mills & Wilson, No. 1 Porterville, Tulare Co.	35-22-27	913	testing
Cummings Pet., No. 1 Porterville, Tulare Co.	27-22-27	790	sd. sh. drilling
Jennings Synd., No. 1 Porterville, Tulare Co.	8-23-28	510	fishing
Terra Bella Drlg Co., No. 2 Porterville, Tulare Co.	34-22-27	920	recemented
Jaques Oil Co., No. 1 Porterville, Tulare Co.	34-22-27	914	suspended
Rayatt Oil Co., No. 1 Porterville, Tulare Co.	34-22-27	970	sd. sh. drilling
Hallock, William, No. 1 Porterville, Tulare Co.	34-22-27	1,090	suspended
Kern Pet. Co., No. 1 Porterville, Tulare Co.	34-22-27	950	sd. sh. drilling
Miller & Sylvan, No. 1 Porterville, Tulare Co.	11-23-27	190	sd. sh. drilling
Larson Oil Co., No. 1 Porterville, Tulare Co.	11-23-27	995	sd. sh. drilling
Larson Oil Co., No. 2 Porterville, Tulare Co.	11-23-27	100	suspended
Hagerty & Caine, No. 1 Porterville, Tulare Co.	2-23-27	816	suspended
Alexander, Ford, No. 1 Porterville, Tulare Co.	34-22-27	1,000	suspended
Kettleman Trust, No. 1 Porterville, Tulare Co.	21-22-27	515	sd. sh. drilling
Lewis, Paul M., No. 1 Porterville, Tulare Co.	15-22-27	998	sd. sh. drilling
Turk & Campbell, No. 1 Porterville, Tulare Co.	34-22-27	1,080	sd. sh. drilling
Wells & Armstrong, No. 1 Porterville, Tulare Co.	10-22-27	210	suspended
Colusa Oil Co., No. 1 Bush, Colusa Co.	31-15- 4	750	hd. sd. drilling
Getty Oil Co., No. 1 Nigger Heaven, Yolo Co.	23-13- 3	3,050	sd. sh. drilling

IMPORTANT SOUTHERN CALIFORNIA WILDCATS

Union, No. 1 Orchard Dale, Los Angeles Co.	10- 3-11	5,190	sd. sh. drilling
Olympic Realty Corp., No. 1 Venice, Los Angeles Co.	14- 2-15	3,450	sd. sh. drilling
Dwyer & Becker, No. 1 Compton, Los Angeles Co.	17- 3-13	4,490	cleaning out
Francia, Don, No. 1 Compton, Los Angeles Co.	8- 3-13	572	suspended
Central Oil Co., No. 1 Compton, Los Angeles Co.	28- 3-13	5,004	redrilling
Combs, E., No. 1 Compton, Los Angeles Co.	18- 3-13	692	sd. sh. drilling
Gunjome Oil Co., No. 1 El Nido, Los Angeles Co.	23- 3-14	rig	suspended
Cal. Ventura Oil Co., No. 1 Manhattan, Los Angeles Co.	30- 3-14	6,525	suspended
Cal. Ventura Oil Co., No. 1 Hermosa, Los Angeles Co.	31- 3-14	3,396	cleaning out
Cal. Ventura Oil Co., No. 2 Hermosa, Los Angeles Co.	31- 3-14	rig	suspended
McMahon & McDonald, No. 1 Watts, Los Angeles Co.	12- 3-14	4,665	suspended
McKeon Drlg. Co., No. 1 Watts, Los Angeles Co.	1- 3-14	180	sd. drilling
Rio Grande Oil Co., No. 1 Watson, Los Angeles Co.	17- 4-13	6,295	suspended
Tenacity Oil Co., No. 1 Dominguez, Los Angeles Co.	11- 4-13	3,580	plugging back
Shell, No. 1 Van Nuys, Los Angeles Co.	19- 2-15	5,180	hd. sd. drilling
Rio Hondo Pet., No. 1 Puente, Los Angeles Co.	14- 2-10	3,736	testing
Rucker & Smith, No. 2 Puente, Los Angeles Co.	27- 2-10	rig	rigging up
Bidart Oil Co., No. 1 Puente, Los Angeles Co.	15- 2-10	2,895	recemented
Bardeen Pet., No. 1 Puente, Los Angeles Co.	9- 2-10	5,000	abandoned
Keck & Hall, No. 1 Puente, Los Angeles Co.	32- 2- 8	1,120	gas—shut in
Marcel Pet. Co., No. 1 Puente, Los Angeles Co.	31- 2- 8	3,000	br. sh. drilling
Ceilto Oil Co., No. 1 Monterey Park, Los Angeles Co.	25- 1-12	5,278	suspended
Los Gatos Oil Co., No. 1 El Monte, Los Angeles Co.	16- 1-11	1,950	cleaning out
Olympic Corp., No. 1 Calabasas, Los Angeles Co.	18- 1-17	5,695	fishing
Union, No. 1 Coyote, Sansinena, Los Angeles Co.	30- 2-10	4,800	testing
Western Gulf, No. 1 Brea Canyon, Los Angeles Co.	28- 2- 9	6,770	hd. sd. drilling
Lamona Oil Co., No. 1 Pomona, Los Angeles Co.	34- 1- 9	965	hd. sd. drilling
Graham & Loftus, No. 1 Coyote, Orange Co.	18- 3- 9	6,733	testing
Ness Pet., No. 1 Newport, Orange Co.	21- 6-10	4,910	suspended
Hall, H. L., No. 1 Newport, Orange Co.	20- 6-10	790	suspended
Standard, No. 1 Newport, Orange Co.	26- 6-10	2,365	hd. sd. drilling
Fidelity Pet. Co., No. 1-A Murrietta, Riverside Co.	23- 7- 3	1,010	suspended
Hemet Pet. Co., No. 1 Ward, Riverside Co.	9- 5- 1	3,560	suspended
Imperial Valley Oil Co., No. 1 Brawley, Imperial Co.	36-11-10	3,240	suspended
McGregor Synd., No. 1 Del Mar, San Diego Co.	17-14- 3	1,365	cleaning out
Borderland Oil Co., No. 1 Encinitas, San Diego Co.	13-13- 4	2,519	suspended
Borderland Oil Co., No. 1 Point Loma, San Diego Co.	30-16- 3	4,150	gr. sd. drilling
Carr, O. K., No. 1 Capistrano, San Diego Co.	13- 8- 8	4,590	hd. sd. drilling
Grey, H. H., No. 1 Redlands, San Bernardino Co.	25- 1- 2	2,388	hd. sd. drilling
Girard & Grimes, No. 1 Corona, San Bernardino Co.	8- 2- 6	1,540	cemented
Western Gulf, No. 1 Santa Ana, Orange Co.	13- 3- 9	mtl.	building rig

Regauge at Hobbs Shows Increases

Potential Over 678,000 Bbls. From 89 Wells. Weld County, Colorado, Well Has Showing of 37 Gravity Oil

By Tolbert R. Ingram
Staff Correspondent, Rocky Mountain Area

DENVER, Colo., Oct. 13.—The Hobbs Pool in Lea County, New Mexico, showed a potential production of 678,406 bbls. daily on October 1 from 89 wells. A regauge of wells that have been on production showed some large increases in individual wells, the Gypsy Oil Co.'s No. 3 Grimes being rated at 24,240 bbls., the largest in the field. State Land Commissioner Criles has requested that the allowable outlet be raised to 35,000 bbls. daily. Two new locations were announced and five wells were completed, the best being Shell Petroleum Corp.'s No. 2 Grimes, given a potential of 18,605 bbls. Tidal's No. 1 Coleman, in the Eunice area, averaged 585 bbls. a day after being shot. The Midwest Refining Co.'s No. 19 Farnsworth, in the Jal area, ran into sulphur water and is being abandoned. The Texas Pacific's No. 1 State in the Cooper area had sulphur water at 5,095 feet and will plug back. One new location and two small completions were reported in Eddy County and one failure was reported in Socorro County.

The principal development in Colorado was a show of 200 feet of 37 gravity oil in the Platte Valley Petroleum Co.'s wildcat in Weld County at 6,610 feet, above the Muddy sand. One new location was made in Larimer County.

In Wyoming, the Ohio Oil Co.'s Garland Dome test to the Madison gives evidence of being a 5,000-bbl. well. Sale of Oregon Basin leases on government land has been approved. The Ohio company is shutting down all its operations in this field. The Midwest Refining Co.'s Madison lime test at Frannie does not look encouraging. Same company has sulphur water in its Wagonhound wildcat in Hot Springs County. Two completions were reported in the Osage Field in Weston County, one of which is making 400 bbls. natural. The Mountain Fuel Supply Co. completed a 3,500,000-foot gas well in Baxter Basin. The Kinney-Coastal Oil Co.'s Pilot Butte deep test is plugging back from the Nuggett sand.

NEW MEXICO

Hobbs Pool—Lea County

The potential production of the Hobbs Pool on October 1, as established by the executive committee in charge of proration, was 678,406 bbls. daily from 89 wells on 79 units of 40 acres each. This compares with 526,044 bbls. from 74 wells on 65 units on September 16 and 415,535 bbls. from 54 wells on 46 units on September 1. A regauge of most of the wells on production for some time showed some interesting results. Seventy wells for which comparisons can be made as of September 16 and October 1 showed a drop from 533,458 bbls. to 517,671 bbls., or a decrease of 15,784 bbls. However, a number of the larger wells showed an increase.

Tidal Oil Co.'s No. 1 Grimes, Section 29-18-38, which held the record for the field with a potential capacity of 21,496 bbls. when it came in, showed 20,093 bbls. on a regauge. Gypsy Oil Co.'s No. 3 Grimes, Section 32-18-38, which now holds first place, was given an increase from 21,972 bbls. to 24,240 bbls. While most wells showed only a slight increase or decrease upon being regauged, there were a few exceptions. Amerada Petroleum Corp.'s No. 1-A State, Section 32-18-38, increased from 19,246 to 22,550 bbls., and Atlantic Oil Producing Co.'s No. 1 Bradley, Section 6-19-38, increased from 3,499 to 5,378 bbls. Getty Oil Co.'s No. 1 McKinley, Section 30-18-38, dropped from 14,062 to 12,701 bbls., and Midwest Refining Co.'s No. 33 Byers, Section 4-19-38, dropped from 21,249 to 17,431 bbls. On the other hand, the Midwest's No. 8 State, on Section 4, jumped from 19,852 bbls. to 23,458 bbls., or to second place in the field. Ohio-Independent's No. 3 State, Section 32-18-38, increased from 12,960 to 21,060 bbls., and Shell Petroleum Corp.'s No. 2 McKinley, Section 19-18-38, decreased from 17,042 to 11,470 bbls.

The allowable outlet for the period October 1 to October 15 was placed at 32,340 bbls. daily, or 4.7 per cent of capacity. It is understood that Doctor Austin D. Crile, commissioner of the State Land Board, has requested the committee to raise this figure to 35,000 bbls. daily, the figure used for the first month of proration.

New Locations

Two new locations were made this week as follows: Humble Oil & Refining Co.'s No. 2-A State, SE cor. Section 27-18-37, 330 feet from the south and east lines, an outside location half a mile south of its No. 1-A State, spudded with machine on September 29, and Tidal Oil Co.'s No. 4 Grimes, SE cor. NE Section 29-18-38, 2,310 feet from the north line and 330 feet from the east line, is a location.

Completions

Five wells were completed, the best being Shell Petroleum Corp.'s No. 2 Grimes, NW cor. SW Section 28-18-38, given a potential of 18,605 bbls. of oil and 7,000,000 feet of gas from pay at 4,045-4,190 feet. The 3-inch tubing was at 4,165 feet. It topped anhydrite at 1,560 feet and had first gas at 2,787 feet and first oil at 3,195 feet. Elevation is 3,650 feet.

Continental Oil Co.'s No. 1-A State, SE NW SE Section 29-18-38, was drilled to 4,178 feet and was rated at 16,826 bbls. of oil and 11,160,000 feet of gas in 24 hours. The 3-inch is at 4,138 feet.

Amerada Petroleum Corp.'s No. 2-A State, NE cor. Section 32-18-38, found pay at 3,970-4,160 feet and was given a potential of 2,656 bbls. of oil and 34,000,000 feet of gas. The 3-inch is at 4,127 feet. Top of the anhydrite was at 1,529 feet and brown lime at 2,770 feet. First gas was at 2,786 feet and first oil at 3,140 feet. Elevation is 3,651 feet.

Empire Gas & Fuel Co.'s No. 2 Hardin, SW cor. NW Section 19-18-38, was given a potential of 5,702 bbls. of oil and 7,000,000 feet of gas from the lime at 4,065-4,210 feet. The tubing was run to 4,180 feet. Top of anhydrite was at 1,490 feet and brown lime at 2,820 feet. First gas was at 2,846 feet and first oil at 3,185 feet. Elevation is 3,665 feet.

Shell Petroleum Corp.'s No. 1-B State, NW cor. Section 33-18-38, was completed at a total depth of 4,175 feet. Top of pay was at 3,968 feet and it was rated at 2,693 bbls. of oil and 43,000,000 feet of gas in 24 hours. The 3-inch is at 4,161 feet. Top of anhydrite was at 1,588 feet and brown lime at 2,770 feet. First gas was at 2,785 feet and first oil at 3,145 feet. Elevation is 3,651 feet.

Ohio Oil Co.'s No. 2 State, SE cor. SW Section 30-18-38, which was reported a completion last week with a potential of 2,124 bbls., was regauged and rerated at 4,506 bbls. in 24 hours. Midwest Refining Co.'s No. 26 Terry, C SE SE, Section 9-19-38, close to the southeastern edge, is showing for a fair producer, but has not been completed. It is bottomed at 4,185 feet in lime and had an increase in oil at 4,150-55 feet. At 4,165 feet it was flowing and made 500 bbls. in 17 hours. Ohio Oil Co.'s No. 4 State-Northrup, NW cor. SE, Section 32-18-38, joint with Independent Oil Co., which was reported a 17,000-bbl. well several weeks ago, showed up better when given a proration test and was rated at 19,180 bbls. of oil and 20,000,000 feet of gas.

Drilling Operations

Routine drilling operations include:

Amerada Petroleum Corp.'s No. 3-B State, SE NW NE, Section 29-18-38, is drilling at 1,665 feet in anhydrite. It topped the anhydrite at 1,560 feet and elevation is 3,653 feet. Same company's No. 4-B State, NE cor. NW, Section 29-18-38, is rigging up rotary at 242 feet.

Atlantic Oil Producing Co.'s No. 1 Grimes, SW cor. SE, Section 20-18-38, is drilling at 3,615 feet in anhydrite. It topped brown lime at 2,875 feet and had first gas at 2,900 feet and first oil at 3,300 feet. Elevation is 3,648 feet.

The California Co.'s No. 3 State, SE cor., Section 29-18-38, is drilling at 3,642 feet in anhydrite, and its No. 4 State, SW cor. SE, Section 29-18-38, is drilling at 3,555 feet in anhydrite and lime. Same company's No. 1 McKinley, C S half S half NW, Section 20-18-38, is coring in lime and anhydrite at 4,000 feet.

Continental Oil Co.'s No. 2-A State, SE cor. SW, Section 29-18-38, is drilling at 4,154 feet in lime, and its No. 3-A State, NE NW SE, Section 29-18-38, is bottomed at 4,080 feet. Same company's No. 2-B State, NW cor. SW, Section 33-18-38, is bottomed at 4,170 feet in lime and ready to be tested. The tubing is at 4,005 feet. Continental's No. 3-B State, C N half N half SW, Section 33-18-38, is standing with 7-inch cemented at 3,945 feet.

Empire Gas & Fuel Co.'s No. 3 Hardin, SE NE NW, Section 19-18-38, has cellar completed, and its No. 3 Fowler, SW cor. NE, Section 31-18-38, has rig on ground.

Getty Oil Co.'s No. 5 McKinley, NE cor., Section 30-18-38, is a temporarily abandoned location.

Gypsy Oil Co.'s No. 6 Grimes, SE cor. SW, Section 32-18-38, topped pay at 3,985 feet and was drilled to 4,166 feet. It is being tubed for test.

Hobbs High, Inc.'s No. 1 Tatum, NW SW SW, Section 35-18-38, is drilling at 4,170 feet in sandy lime.

Humble Oil & Refining Co.'s No. 1-A State, NE cor. SE, Section 25-18-37, is drilling at 3,790 feet in lime and anhydrite. Top of brown lime was at 2,815 feet, first gas at 2,830 feet and first oil at 3,260 feet. Elevation is 3,667 feet. Same company's No. 10 Bowers, NE NW SW, Section 29-18-38, is drilling at 3,765 feet in anhydrite and lime. It gauged 55,000,000 feet of gas at 3,630 feet. Humble's No. 1 Grimes, SW NE NE, Section 29-18-38, is drilling at 3,956 feet and had the first oil at 3,220-40 feet.

Mid-Continent Oil Co.'s No. 1 Fowler, NE NW NW, Section 31-18-38, has rig up.

Midwest's Operations

Midwest Refining Co.'s No. 26 State, C SE SW, Section 4-19-38, is drilling at 2,872 feet in lime. It had first gas at 2,815 feet and more gas at 2,855 feet. Same company's No. 6 McKinley, NW cor., Section 5-19-38, cemented 7-inch at 3,974 feet, and its No. 1 McKinley, NE cor. NW, Section 5-19-38, is drilling at 3,535 feet in lime. It had a show of oil and gas at 3,210-16 feet and a show of gas at 2,800-10 feet. Midwest's No. 29 Turner, C SW SW, Section 34-18-38, is drilling at 1,660 feet in anhydrite, which formation was topped at 1,575 feet.

Ohio Oil Co.'s No. 4 State, SE SW SW, Section 30-18-38, has cellar completed. This is a corrected location. Same

NEW PRODUCERS FROM DEEP LIME TURNER VALLEY DEVELOPMENT

By Victor Lauriston
Staff Correspondent, Canadian Fields

CHATHAM, Ontario, Oct. 11.—Recent development work in the Turner Valley Field has been featured by several new producers from the deep lime. Most notable was East Crest Oil Co.'s No 2-A, LSD 4, Section 16-19-2w5, in the South Turner Valley, which is not merely a big well, but has materially extended the proven area. The location is considerably southeast of the Home wells, and east of the Mayland-Lowery producing area, and on the east fold of the Turner Valley structure. This area had already been proven in the deep lime by two tests, Homestead Oils' No. 1, LSD 5, Section 16-19-2w5, and East Crest's No. 1, in LSD 5-6. Both were small producers.

East Crest's No. 2-A got production at 4,597 feet, about 354 feet in the lime. Initial wet gas flow measured around 19,000,000 feet. The hole was carried down 22 feet without materially increasing the flow, when it was decided to take production. It now stands at 4,619 feet with 8-inch hole to the bottom. The first 24 hours on one separator the recovery amounted to 370 bbls., increasing ultimately to 470 bbls., with aggregate of 3,100 bbls. for the first week, an average of 443 bbls. a day. Since then the gas flow has increased to 21,000,000 feet with recovery of over 500 bbls. The crude naphtha tests 71° Be. Production is being taken by Regal Oil & Refining Co., which has extended its pipe line; and a second separator is being installed to insure complete naphtha recovery from the wet gas. The wet gas flow is normally around 19,000,000 feet, but at times heads up to around 30,000,000 feet. The separators are being arranged to build up uniform back pressure of around 1,100 pounds to prevent freezing.

East Crest's No. 1, LSD 5-6, is being cleaned out and new valves installed to raise the back pressure to around 1,100 pounds. The production, originally between 40 and 50 bbls., is reported to show some increase. Homestead Oils' No. 1, LSD 5, which started at around 50 bbls., is reported to have increased to around 80 bbls. This production also is being taken by Regal Oil & Refining Co. The East Crest Oil Co. is reported planning to start its No. 3 well in the near future. Boller, Sherman & Boller of Tulsa handled the drilling of the East Crest wells, No. 2-A being carried to large production in about six months.

South and west of the East Crest producers, Miracle Oils' No. 1, LSD 11, Section 4-19-2w5, is adding another producer to the Mercury group. This test got the lime at 5,615 feet, and entered the first porous zone at 5,270 feet. At 5,434 feet a second porous band had been drilled through and production is being tested. No estimate has been made of the wet gas flow, but it looks like a large well. Miracle Oils, Ltd., is controlled by a syndicate headed by A. H. Mayland, head of Mercury Oils, Ltd., and drilling was handled under contract by the Union Drilling Co., rotary tools being used. In the same area, Mercury Oils'

(Continued on Page 122)

company's No. 3 State, NW cor. SW, Section 30-18-38, is bottomed at 4,208 feet in lime and ready to be tested. The 3-inch tubing is at 4,108 feet. The Ohio company's No. 5 State-Northrup, SW cor. SE, Section 32-18-38, cemented the 7-inch at 3,925 feet.

Shell Petroleum Corp.'s No. 2 Berry, NW cor. SE, Section 31-18-38, spudded on September 25 and cemented 12½-inch at 238 feet in the red beds, and its No. 1-B McKinley, C N half N half SW, Section 20-18-38, is drilling at 3,960 feet in lime and anhydrite. Shell's No. 2-B McKinley, SE cor. SW, Section 20-18-38, is drilling at 3,310 feet in anhydrite, and its No. 8 McKinley, C N half N half SE, Section 19-18-38, is rigging up rotary at 235 feet. It spudded with machine on September 26.

Skelly Oil Co.'s No. 2 Fowler, SE cor. NW, Section 31-18-38, is ready to spud.

Sun Oil Co.'s No. 2 McKinley, C SE NE, Section 5-19-38, is drilling at 3,810 feet in lime and had an increase in gas at 3,640-70 feet, and its No. 3 McKinley, NW cor. NE, Section 5-19-38, is drilling at 3,045 feet in anhydrite. Last named topped brown lime at 2,778 feet and had first gas at 2,784 feet.

The Texas Company's No. 2 McKinley, C NE SE, Section 5-19-38, cemented 7-inch at 3,960 feet in lime, and its No. 3 McKinley, C SW SW, Section 4-19-38, cemented 7-inch at 3,960 feet.

The Texas Pacific Coal & Oil Co.'s No. 2-G State, NE cor. SE, Section 24-18-37, is bottomed in lime at 4,208 feet and drilling by six joints of tubing.

Tidal Oil Co.'s No. 3 Hardin, SW NW NE, Section 19-18-38, spudded September 29 and cemented 12½-inch at 219 feet in red rock, and its No. 2 Hardin, SW SE NE, Section 19-18-38, spudded September 28 and cemented 12½-inch at 237 feet.

Eunice Area—Lea County

Tidal Oil Co.'s No. 1 Coleman, SW cor. NE, Section 17-21-36, responded favorably after being shot with 70 quarts at 3,868-3,978 feet and averaged 585 bbls. daily after the shot. It has been shut in. It averaged 300 bbls. before being shot and after plugging back from 4,147 feet to 3,968 feet. George F. Getty, Inc.'s No. 1 State, NE cor., Section 19-21-36, gauged 332 bbls. first 12 hours through 3-inch tubing at 1,500 feet and was shut in for orders. Total depth is 4,000 feet and top of pay was at 3,870 feet. This well and Tidal's well indicate a width of approximately a mile to the pool. Continental Oil Co.'s producer, No. 1 Meyers, is located between the two wells. Ohio Oil Co.'s No. 1 State-McDonald, farther southeast and apparently on a separate high, was plugged back from 3,900 feet to 3,880 feet and made 43 bbls. of oil with 25,000,000 feet of gas through 3-inch tubing in 15 hours. It was then shut in.

Jal Area—Lea County

Midwest Refining Co.'s No. 19 Farnsworth, NW SW SW, Section 14-26-37, 1 mile northeast of No. 1 Rhoades, discovery well in the Jal area, and 1¼ miles southwest of its No. 19 Farnsworth, is being plugged to abandon at a total depth of 3,877 feet. It had 2,000 feet of sulphur water at 3,820 feet. It went considerably deeper than most wells in that district. Top of brown lime was at 2,565 feet and at 3,078 feet it showed some gas and looked as if it would be a producer. It is the only well drilled in the Jal area for some time.

Cooper Area—Lea County

Texas Pacific Coal & Oil Co.'s No. 1 State, SE cor. SW, Section 22-23-36, has a hole full of sulphur water at a total depth of 5,095 feet and is preparing to plug back. Some time ago it was completed at 3,668 feet as a 15,000,000-foot gas well after plugging back and recently it resumed to drill deeper. It had a show of oil at 4,235-4,300 feet, followed by sulphur water.

Lovington Area—Lea County

Galt, Brown and others' No. 1 State, NW NW, Section 9-15-35, is bottomed at 810 feet in the red beds with a hole full of water and is cleaning out to lower 15½-inch.

Eddy County

R. D. Compton's No. 3 Brainard, SW SE SE, Section 5-18-27, northwest of Artesia Pool, which opens a new pool, was completed at 1,259 feet, 1 foot in the pay and made 70 bbls. the first 24 hours. Elevation is 3,491 feet. He has made a location for No. 4 Brainard, an offset on the north, in the NW SE SE, Section 5-18-27. Lockhart & Co.'s No. 2-X Parke, NE NW NW, Section 23-17-30, Maljamar area, was completed in the pay at 3,405-12 feet and made 52 bbls. the first seven hours. It made 100 bbls. in the next 24 hours, flowing by heads. It is three-fourths mile northwest of Henderson, Dexter & Blair's No. 1 Arnold, which averaged 25 bbls. per day after plugging back to shut off sulphur water. Leonard & Lever's No. 4 State, SE SW, Section 21-17-29, is drilling at 2,150 feet in gray lime. It topped the lime at 2,097 feet. The 6⅝-inch is at 2,127 feet. Getty Oil Co.'s No. 6 Dooley, C NW SW, Section 24-20-29, in the Twin Mounds Pool, is resuming after completing cellar and shutting down. This is expected to be a 6,000-foot test of horizons below the black oil pay at around 1,200 feet.

Caprock Area—Lea County

Texas Production Co.'s No. 1 Bridge, SE cor. NW, Section 17-17-34, is drilling at 1,750 feet.

Otero County

R. H. Ernest and others' No. 1 Located Land Co., 330 feet west of the east line and 330 feet north of the south line of Section 20-25s-7e, is drilling at 798 feet.

Socorro County

Lockhart & Co.'s No. 2 Stackhouse, SE cor. SW, Section 14-3s-6e, Chupadera Mesa, was dry and abandoned at 2,772 feet. It started in the lower red beds and topped Abo sand at 500 feet.

Luna County

Angelus Oil & Mining Co.'s No. 3 State, NW SE, Section 20-21-10w, near Deming, is drilling at 5,710 feet in the Pennsylvanian and has had shows of gas for the past 100 feet. The company is financed largely by the Pacific Electric Co. of Los Angeles and the association has 40,000 acres in the block.

San Juan County

Murchison Oil Co.'s No. 2 Angel Peak, SW SE, Section 11-28-11, Kutz Canon, is drilling with rotary at 355 feet. It will mud off the Picture Cliff and go through the Lewis shale to test the Mesa Verde and may go to 5,000 feet. Kutz Canon Oil & Gas Co.'s No. 1 Day, SW cor., Section 20-28-10, is bottomed at 1,996 feet in the Picture Cliff and undereaming 6⅝-inch to bottom. Continental Oil Co.'s No. 24, SW cor. NW, Section 1-29-19, Rattlesnake Dome, is drilling at 1,700 feet in white lime. The Dakota series were mudded off. San Juan Leaseholds Co.'s No. 3 Bowman, NW NE, Section 30-30-15, is drilling again and is below 2,550 feet.

COLORADO

Weld County

The Platte Valley Petroleum Co.'s No. 1 Patterson, NE SW SW, Section 24-6n-61, on the Greasewood Dome in Weld County, Colorado, 50 miles east and a little south of the Fort Collins-Wellington Field in Larimer County, reported another show of oil this week in what is supposed to be the Benton shale above the Muddy sand of the Dakota series. The quantity of oil in the hole at any one time varied according to different reports from 10 feet to 2,500 feet, but the company claimed a maximum of 200 feet at 6,610 feet. Oil began showing at 6,565 feet, there being just enough to coat the tools and permit taking a sample. It increased from the shale to 6,610 feet when it was reported at the maximum of 200 feet. The 4¾-inch is being carried close behind the tools and this oil has now been shut off and none is appearing in the hole. It is drilling at 6,630 feet in a dry hole. It is bottomed in a very hard formation, but, according to the driller, has not yet entered a sand. The next objective is the Muddy, the first sand in the Dakota series and the producing horizon at Fort Collins. The Benton shale was topped at 6,240 feet and that horizon is from 583 to 640 feet thick as reported in United States Geological Survey Bulletin No. 796-B, based on rocks exposed at the surface in that area. On this basis, the Muddy should be expected somewhere between 6,823 and 6,880 feet. The company, in anticipation of bringing in an oil or gas well, has applied to the State Public Utilities Commission for a permit to build a pipe line to Orchard or Goodrich. This is a precautionary measure to protect its interests in the event of a discovery. The oil tested 37 gravity.

Larimer County

Poudre River Oil Co.'s No. 1 Warren, NE cor., Section 33-8n-69, northwest of Fort Collins, landed 3½-inch on bottom at 3,600 feet and cemented it, but the cement failed to hold and the job is being done over. Continental Oil Co.'s No. 1 Howwman, SW NE, Section 24-4n-70, Deininger Dome, is drilling at 1,415 feet in red shale and white sand. This well was expected to test the Pennsylvanian at a total depth of 1,250 feet, but the formations are running much deeper. It was in red shale and lime at 1,360 feet. Standard Oil Co. of Colorado is moving in for its No. 2 State, C NW, Section 16-4n-69, on the Berthoud Dome. The location is one-fourth mile northeast of Midwest Refining Co.'s No. 1 State, which was drilled to the Morrison at 4,031 feet several years ago after passing through good shows of oil and gas in the upper horizons, and three-fourths of a mile north and a little east of the Standard's No. 1-A State, a gas well. The new operation, for which standard rig is being built, will be carried to the gas at around 3,000 feet. The company has made a deal for the sale of its gas to the Eastern Colorado Gas Co. which proposes to market it in northern Colorado. Continental Oil Co.'s No. 3 Scott, SW SE, Section 6-9-68, Wellington Dome, is standing at 4,585 feet with cave cemented. Stanley M. Barrows' No. 1 Munroe, C NW NE, Section 26-11n-69, Round Butte, is drilling at 137 feet and had a show of live oil in the top of the Pierre shale. This is considered very encouraging as the fractured shales in which oil is most likely to be found are not expected until the hole gets down close to the Niobrara. However, the area is faulted and anything may happen. C. Leonard Smith's No. 1 State, SE cor., Section 36-12n-70, 6 miles west of Round Butte, has spudded in its fourth hole, but has been delayed by a cloudburst which washed out bridges and hindered delivery of supplies.

Arapahoe County

MacDeb Drilling Co.'s No. 1 Fitzsimmons, NE, Section 7-4s-66, is bottomed at 5,692 feet and is swedging 6¼-inch at 5,100 feet. The work is coming along nicely and it is believed if the pipe is straightened out at this point not much additional trouble will be encountered below 5,100 feet to bottom.

Jefferson County

Ruby Hill Oil & Gas Co.'s No. 1 Braden, SE cor., Section 24-4s-69, is drilling at 3,680 feet in a very hard formation in which only 18 inches was made in 24 hours. Gas bubbles are showing on the bailer.

Pueblo County

Kuykendall Oil Corp.'s No. 1 Beecher, SW cor., Section 7-22-66, Rock Creek, set casing at 441 feet to shut off the Dakotas and is drilling in the top of the Morrison formation at 500 feet.

Fremont County

Continental Oil Co.'s No. 1 Shaw, SE NW, Section 2-19-70, Canon City district, is drilling at 1,900 feet.

Huerfano County

Midland Petroleum Co.'s No. 1 Campbell, NE SE, Section 4-29s-69, Oak View, is preparing to resume at 500 feet after being shut down for the past month.

Park County

South Park Oil & Gas Co.'s No. 1 Esche, SE NW, Section 5-9s-76, Muleshoe Dome, is drilling at 500 feet in a 12½-inch hole in shale. The shale is easy drilling and as high as 8 feet an hour has been made. South Park Oil Co.'s No. 1 Milligan, NE SE, Section 13-8s-76, Jefferson district, is bottomed at 1,580 feet and preparing to run and cement 8¼-inch on bottom on top of a sand in the Frontier.

Routt County

Texas Production Co.'s No. 4 Carstarphen, NW NW, Section 5-6n-86, Tow Creek, is bottomed at 1,930 feet and preparing to run 10-inch.

La Plata County

McGarr Petroleum Corp.'s No. 1 Sanchez, SE NE, Section 27-33-12, Red Mesa, is reported to have topped the Dakota at 3,155 feet and to have found it

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THREE COMPLETIONS COMPRISE WEEK'S WORK IN MICHIGAN FIELD

By Special Correspondent

MUSKEGON, Mich., Oct. 13.—Three completions, only one of which, located in the Leaton Pool of the Mount Pleasant area, was a producer, comprised the entire list in Michigan during the past week.

The fact that none of the three is located in either of the old proven fields at Muskegon or Mount Pleasant is to some extent indicative of the trend in Michigan at the present time, where several wildcat areas are attracting the attention of operators.

Livingston County in the south central portion of the State, where known producing formations such as the Traverse and Dundee lie at a comparatively shallow depth because of the regional dip, is one of the most active centers of wildcat drilling operations with three wells under way.

Operators are practically certain that there is a favorable structure in Livingston County and several of the larger companies are interested in large blocks of acreage there.

Four wildcats are drilling in Shiawassee County, three on Hansen's Island in St. Claire County and three in Clare County north of the Mount Pleasant proved field. These constitute other interesting areas in the State.

Six wells are active in the Muskegon Field and two test wells are being drilled directly north of the field by the Reed Oil Co.

About the same number of wells are drilling in the older sections of the Mount Pleasant proved field with 10 active in and near the Leaton Pool.

225-Bbl. Well

The Ohio Producing & Refining Co.'s No. 1 Wezensky, SW SW, Section 19-15n-3w, Denver Township, Isabella County, was completed this week as the fifteenth oil producer in the Leaton Pool, where five dry holes also have recently been finished.

The Ohio-Wezensky made 225 bbls. initial daily flow after being drilled to a total depth of 3,655 feet. Dundee formation was topped at 3,595 feet and when first drilled a few feet into the pay sands topped at 3,634 feet it was estimated to be only a 50-bbl. well. Deeper drilling increased production until it became one of the best wells in the area, at the present time ranking with the New York Petroleum Royalty's No. 1 P. J. Marthey, the discovery well, and Gibson, Johnson & Borden's No. 1 Cole.

A total of 179 producers now have been completed in and near Mount Pleasant.

Two semiwildcats in the area, one in Sherman Township, Isabella County, and the other in Brady Township, Saginaw County, were dry and abandoned.

Operators sought commercial production of natural gas in the Marshall formation in William Cline and others' No. 1 Eddy estate well, SE SE, Section 11-15n-6w, Sherman Township. When they failed to get it they decided to abandon the well at 1,706 feet.

The Smith Petroleum Co.'s No. 1 Chase, NE NE, Section 21-9n-2e, Brady Township, struck salt water in the Dundee formation at 2,960 feet and was abandoned as a dry hole.

Three wells in the main Mount Pleasant Field that are nearing completion are the Dixie Oil Co.'s No. 8 N. Davis,

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Wildcat Discoveries in Permian Basin

Crane County Well Opens Potential Pay Horizon. Ward County Extension. Crane-Upton and Ector Proration Protest

By L. E. Bredberg
Fort Worth Bureau, The Oil and Gas Journal

FORT WORTH, Tex., Oct. 13.—Wildcat discoveries in the Permian Basin are not tending to give any aid in proration matters of this district and the State, but as West Texas has pioneered in proration, and has had less trouble shutting in various producing areas, more newly opened fields are not liable to cause much more figuring on the part of the umpires and advisory committees in setting allowances for the new and old fields. As was needed in the past, curtailment of an area should start at the discovery of the new pool, and pools opened from now on will probably be systematically handled in this way, setting production allowances on the acreage and potential basis, as is done in the Yates Field, Pecos County, at the inception of a new pool.

Cranfill Brothers of Dallas and the Gulf Production Co. opened up another productive spot in the basin, from the Permian lime. The Texas Pacific Coal & Oil Co. has extended production in Ward County. Eastern Howard County has another well in a semiwildcat area, and Cromwell, Tanner and others have opened up another small producing area 4½ miles east of the Taylor-Link Pool, Pecos County. These are possible disturbers but production in Texas has been showing a decline since general proration went into effect in August.

Important Discovery

Cranfill Brothers and the Gulf Production Co. made one of the most important discoveries yet made in the Permian Basin proving hundreds of thousands of acres good for potential production, when their wildcat test in western Crane County topped a high gravity oil pay in the Permian lime at a total depth of 4,295 feet and was temporarily shut down flowing 100 bbls. the first five minutes before being shut in. This discovery is in the SE cor. NE, Section 8, Block B-27, and has an elevation of 2,526 feet.

Salt was topped at 505 feet in the well, and base of the main salt was logged at 1,320 feet. Gas was struck at 1,410 feet several months ago, and an increase was encountered from 1,595-1,610 feet.

Top of the white lime was marked at 2,455 feet, and 50,000 feet of gas was struck at 2,665-76 feet, 1,500,000 feet was encountered at 2,811 feet and an increase picked up at 2,865 feet, with 6,000,000 feet showing at 2,930 feet.

The location for this well was a favorite with the majority of the geologists and the test was therefore closely watched for production, especially after encountering the various amounts of gas, and slight showings of oil, but when it made only a small head of oil and some gas and the rig burned on July 13 interest rather slumped. A fishing job also caused interest to fall off, and when it struck the pay at 4,295 feet it was an utter surprise to practically everyone, for the test had almost become relegated to the list of dry holes already drilled in the basin.

This is the first well in West Texas to pick up production after it had encountered sulphur water, and possibly many other tests might have become producers if the bugaboo of sulphur water had not caused their plugging. The pay was logged 275 feet below where the last water was encountered. First sulphur water was found at 3,000-03 feet, and at 3,895 feet had 2,000 feet in the hole.

There are only four other tests in West Texas that are deeper in the lime. One is in the old Burleson or McCamey Field in Upton County, drilled by the Continental Oil Co. and three are in Pecos County. The deepest test to be drilled in the lime was Shell Petroleum Corp.'s No. 1 University in Section 23, Block 26. It went to a total depth of 5,204 feet, where it penetrated granite. Elevation was 2,496 feet. The Southern Crude Oil Purchasing Co. drilled the deepest well in the Hendricks Pool, Winkler County, on Tract No. 1 in the SW cor., Section 33, Block 26. It went to 1,458 feet in the lime; total depth was 3,962 feet. Elevation was 2,846 feet, and the salt was topped at 2,094 feet. Top of the Brown lime was logged at 2,505 feet. It made an initial production of 10,000 feet at 2,800 feet and later when drilled deeper encountered a better pay at 2,919 feet.

Seven-inch casing was set at 4,040 feet in the Cranfill Brothers and Gulf well, and the Gulf Production Co. took over the production of the test at 3,500 feet when it was almost given up as a dry hole. Before any wildcat test is hereafter abandoned by independents and companies they will think twice before plugging, for now there seems no limit to the possibilities of West Texas. Sulphur water is no longer to be a dreaded quantity and casing will be set to shut it off and drilling resumed until the lime has been tested to the satisfaction of those drilling the test.

New Potential Pay Horizon

This discovery gives another potential pay horizon to the McElroy and Church-Field Pools, 18 miles to the east in Crane County, and also to the Yates Field, Pecos County, to Ward County producing areas and to the Winkler County fields. There seems to be no limit now to potential possibilities in the Permian Basin, and leases and royalties take on another aspect because of this discovery. Those that have seemed worthless because of shallower tests being abandoned nearby, are given another chance for production.

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WILDCAT OPERATIONS IN WEST TEXAS

Week Ended October 13

ANDREWS COUNTY

Company, well, farm name, section and block—	Remarks—
Fuhrman Pet. Corp.'s No. 1 Ford, 440 ft. from S and 2,200 ft. from W of Sec. 16, Bl. A-43, Public School Land	Drlg. 4,455 ft.
Deep Rock Oil Co. et al's No. 1 King, 330 ft. from N and 2,310 ft. from E, Sec. 11, Blk. A-46	Top pay 4,335 ft.; flows every 4 days; temporarily abandoned; total depth 4,454 ft.

BREWSTER COUNTY

Brewster Oil Co.'s No. 1 fee, 2,640 ft. S and 2,598 ft. E of NW cor. Sec. 45, Blk. G-15, G.C.&S.F. Sur.	Shut down 1,935 ft.
E. L. Chapman's No. 1 Skinner, C SW SE Sec. 100, Blk. 2, G.C.&S.F. Sur.	Shut down 1,302 ft.
Trans-Pecos Oil & Gas Co.'s No. 1 Jones, 920 ft. from N and 2,500 ft. from E of Sec. 18, Blk. G-15, G.C.& S.F. Sur.	Shut down 2,510 ft.
Van McPhail's No. 1 McIntyre, SE cor. Sec. 59, Blk. 352, 7 mi. S of Alpine	Shut down 1,750 ft.

CONCHO COUNTY

Beesley et al's No. 1 S. Waring Est., 1,320 ft. from S and E of A. T. Robinson Sur., Abst. 2,120	Spudded and shut down.
Turner et al's No. 1 Borsig, 150 ft. from S of NE cor. G. Emmig Sur. 130, 6 mi. W of Paint Rock	Shut down 1,720 ft.

CRANE COUNTY

Cranfill Bros.' No. 1 Muir, 330 ft. from N and 2,310 ft. from W, Sec. 23, Blk. B-37, Public School Land	Drlg. 2,575 ft.

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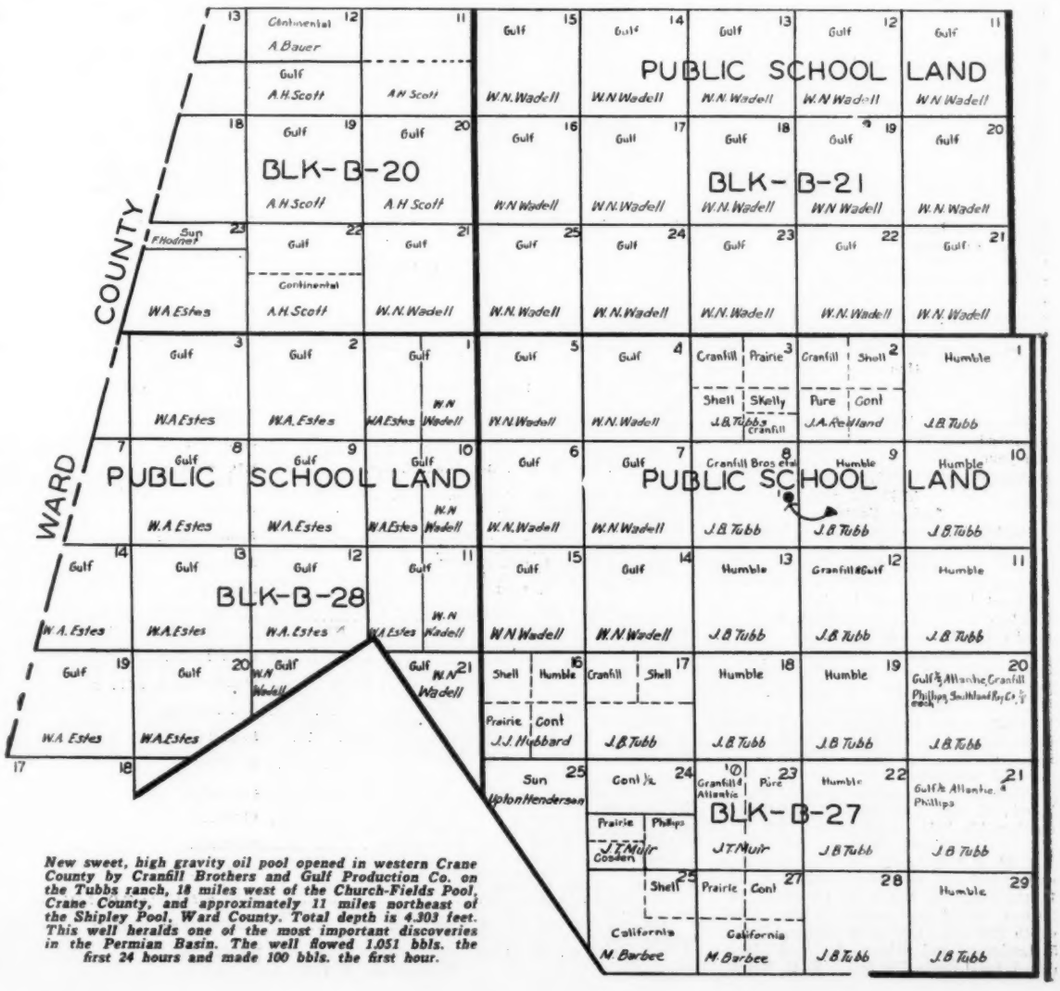


New sweet, high gravity oil pool opened in western Crane County by Cranfill Brothers and Gulf Production Co. on the Tubbs ranch, 18 miles west of the Church-Fields Pool, Crane County, and approximately 11 miles northeast of the Shipley Pool, Ward County. Total depth is 4,303 feet. This well heralds one of the most important discoveries in the Permian Basin. The well flowed 1,051 bbls. the first 24 hours and made 100 bbls. the first hour.

Panhandle and Wichita Falls Increase

Gray County Led in Completions in One District, Wichita County in Other. New Wichita Falls Umpire

By L. E. Bredberg
Fort Worth Bureau, The Oil and Gas Journal

FORT WORTH, Tex., Oct. 13.—Holding production down in the Panhandle is a fair sized job for any organization, and while in the past few weeks production has decreased considerably, this week it took a turn for the reverse and showed a 1,026-bbl. increase, the Wichita Falls district also showing an increase of 2,405 bbls. Gray County led in number of completions in the Panhandle district while Wichita County led in completions in the latter district.

Roeser & Pendleton and T. B. Slick's No. 1 Jeffrey, 2 miles north of the Graham Pool in which Nash and Windfohr produced a phenomenal deep well some few months ago, is showing for a deep producer from the Caddo lime topped at 3,885 feet. Total depth of the well is 3,915 feet. In one hour it gauged 102 bbls. and appears as a possible pool opener, although many were fooled by the Nash & Windfohr well, paid exceedingly high prices for near-by acreage, and no more such wells were completed around it, and this new discovery will no doubt cause many to be skeptical, thinking it may be the same type of producer as the other. It is 2,250 feet south of the most southerly southwest corner of the D. Brown Survey, Abstract 1,228, and is about 1¾ miles northeast of the Green Oil & Refining Co.'s discovery completed a few weeks ago.

Wichita Falls Umpire

The North Texas Oil and Gas Association's proration committee elected L. V. Hull as umpire in the Wichita Falls district. He is to assume his duties about the middle of October. He was formerly general manager of the Wichita Pipe Line Co., and has had wide experience in the handling and marketing of crude, experience which will be greatly needed in this district which is one of the most difficult in Texas to handle due to its geographical location in regard to Oklahoma and Texas fields.

The Arcadia Refining Co.'s No. 1 Golson, in the I. K. Harris Survey, which created an extension in the Burkett Pool, Coleman County, during the week of September 11, when it topped the Cross Cut sand at 1,576 feet and was completed at a total depth of 1,576½ feet for 164 bbls. in 12 hours, has put a total of 7,500 bbls. of 43 gravity oil in tanks. Seven wells are drilling in this area at the present time, two expected to be completed within a week.

The Overall Pool, Coleman County, produced 405 bbls. per day, average for the past week.

COMPLETIONS IN NORTH CENTRAL TEXAS

Archer County

Panhandle Refining Co.'s No. 1 Snider, dry and abandoned, total depth 802 feet.

Cooke County

Deep Rock Oil Corp.'s No. 2 Perkins, oil sand 1,318-19 feet, 1,321-24 feet and 1,324-27 feet, initial production 70 bbls., total depth 1,330 feet.

Montague County

Lesh and McCall's No. 1 Lemons, dry and abandoned, total depth 3,059 feet.

Wichita County

Childress and McKinney's No. 1 Leberman, dry and abandoned, total depth 846 feet. C. E. Cloye's No. 1 Williamson, dry and abandoned, total depth 495 feet. Featherstone and others' No. 1 W. S. North, oil sand 1,076-91 feet, initial production 1½ bbls., total depth 1,091 feet.

Young County

F. H. E. Oil Corp.'s No. 1 Jeffery, dry and abandoned, total depth 904 feet. P. F. Gwynn's No. 1 Jeffery, oil sand 710-20 feet, initial production 215 bbls., total depth 720 feet. George Mollenkoph's No. 6 Larimore and others, dry and abandoned, total depth 730 feet. E. R. Riggs' No. 1 Kirkland, oil sand 692-704 feet, initial production 105 bbls., total depth 704 feet. W. N. Scott's No. 6 Keith, oil sand 654-60 feet, initial production 12 bbls., total depth 660 feet. Sid Swink's No. 2 C. Belknap Co., dry and abandoned, total depth 710 feet. Young Brothers and Alexander's No. 9 Remington, dry and abandoned, total depth 750 feet.

COMPLETIONS IN PANHANDLE DISTRICT

Carson County

Dunlop's No. 6 Morse, total depth 2,700 feet, shot 400 quarts 2,603-2,710 feet, initial production 384 bbls. British American and Shell Petroleum Corp.'s No. 3 Smith, total depth 3,228 feet, shot 150 quarts 3,175-3,228 feet, initial production 572 bbls. Champlin Refining Co.'s No. 5 McLaughlin, top pay 2,940 feet, initial production 150 bbls. oil and 4 per cent water, total depth 2,973 feet. Danciger Oil & Refining Co.'s No. 1 Cattin and others, total depth 3,115 feet, shot 140 quarts from 3,071-3,107 feet, pumped 27½ bbls. in two hours, pumped off; pumped 30 bbls. in two and one-half hours next day, pumped off. Danciger Oil & Refining Co.'s No. 8 Jackson, dry and abandoned, total depth 3,146 feet. Dye & Gillette's No. 1 McConnell, top pay 3,295 feet, initial production 375 bbls. in 12 hours, total depth 3,298 feet. Magnolia Petroleum Co.'s No. 1 Sailor, top pay 3,140 feet, initial production 209 bbls., total depth 3,225 feet.

Hutchinson County

Sinclair Oil & Gas Co.'s No. 1-B Johnson Brothers, dry and abandoned, total depth 2,905 feet. Timms and others' No. 2 Morse, top pay 3,053 feet, shot 40 quarts 3,053-68 feet, shot 68 quarts 3,090-3,116 feet, initial production 175 bbls., total depth 3,120 feet.

Wheeler County

Magnolia Petroleum Co.'s No. 2 Worley, top pay 2,175 feet, initial production 10 bbls. oil and 3,000,000 feet of gas, total depth 2,310 feet. Murchison & Fain's No. 1 Brown, top pay 1,705 feet, initial production 25,000,000 feet of gas, total depth 1,835 feet. Upham Gas Co.'s No. 2 Williams and Laycock, top pay 1,840 feet, initial production 28,000,000 feet of gas, total depth 1,954 feet.

COMPLETIONS IN RANGER DISTRICT

Palo Pinto County

Lasater and others' No. 1 T.&P.R.R. Co., shot 20 quarts, initial production 1,897,000 feet of gas, total depth 3,503 feet.

Shackelford County

Carter Development Co.'s No. 1 Nail, dry and abandoned, total depth 1,692 feet.

Stephens County

Price's No. 1 Bruce, top pay 2,038 feet, shot 20 quarts, initial production 35 bbls., total depth 2,122 feet.

Urban and others' No. 1 Riddle, total depth 2,036 feet, plugged back to 2,025 feet, shot 10 quarts 2,006-16 feet and 30 quarts 1,960-90 feet, initial production 25 bbls.

Throckmorton County

Brihilt Oil Corp.'s No. 1 Couger, dry and abandoned, total depth 1,430 feet.

Seitz, Comegys & Seitz's No. 1 McKeicham, top pay 724 feet, initial production 8 bbls. oil and 18 bbls. of water, total depth 738 feet.

T. B. Slick and others' No. 1 Reynolds Land & Cattle Co., dry and abandoned, total depth 1,540 feet.

WILDCAT OPERATIONS IN TEXAS PANHANDLE

Week Ending October 13

Company, well, farm name, section and block—	Remarks—
CARSON COUNTY	
Empire G. & F. Co.'s No. 1 Jordan et al, C SE, Sec. 94, Blk. 4, I.&G.N. Sur.	Location.
Empire G. & F. Co.'s No. 1 Simms, 2,310 ft. N, 990 ft. E, N½, Sec. 12, Blk. 7, I.&G.N. Sur.	Rigging up.
Empire G. & F. Co.'s No. 1 McConnell, C S½ SW, Sec. 66, Blk. 4, I.&G.N. Sur.	Drlg. 2,640 ft.
Gibson Oil Corp.'s No. 1 Foster & Co., C NW, Sec. 24, Blk. 7, I.&G.N. Sur.	Location.
North American Oil Co.'s No. 1 Burnett, C SE, Sec. 98, Blk. 4, I.&G.N. Sur.	S.D. 1,840 ft.
North American O. & G. Co.'s No. 1 McEwen, C SE, Sec. 1, Blk. 4, I.&G.N. Sur.	Rig on ground.
Shamrock O. & G. Co.'s No. 1 Duncan, 330 ft. S and W, NE, Sec. 5, Blk. 7, I.&G.N. Sur.	Drlg. 3,280 ft.
Sweeney et al's No. 1 Locke, 164 ft. N and W 40-ac. tr. along R.R. in Sec. 57, Blk. 7, I.&G.N. Sur.	S.D. 1,000 ft.
CHILDRESS COUNTY	
C. L. Sloane et al's No. 1 B. P. Smith, Sec. 49, F. P. Knott lands	T.D. 5,000 ft.
COLLINGSWORTH COUNTY	
Dixon et al's No. 1 Bell, 330 ft. N, 1,320 ft. W, Sec. 102, Blk. 21, H.&G.N. Sur.	Spudded and S.D.
DONLEY COUNTY	
Blue Bonnett Oil Co.'s No. 1 Ball, 1,075 ft. N, 985 ft. E, Sec. 22, Blk. E, D.&P.R.R. Sur.	T.D. 3,006 ft; contract depth.
GRAY COUNTY	
Amalgamated German-American Oil Co.'s No. 1 Webb, 330 ft. S and W, E½ NW, Sec. 12, Blk. A-9, H.&G.N. Sur.	S.D. 2,708 ft.
Atlantic Oil Prod. Co.'s No. 1 Reynolds, 330 ft. N and W, NE SE, Sec. 84, Blk. 3, I.&G.N. Sur.	Standardizing 2,865 ft.
British-American Oil Co. and Shell Pet. Corp.'s No. 1 Smith, 330 ft. S and E, NW, Sec. 138, Blk. 3, I.&G.N. Sur.	Location.
British-American Oil Co. and Shell Pet. Corp.'s No. 1 Richardson, 330 ft. N and W, E½, Sec. 127, Blk. 3, I.&G.N. Sur.	Standardizing 2,877 ft.
British-American and Shell Pet. Corp.'s No. 2 Richardson, 330 ft. NE W½ NE, Sec. 127, Blk. 3, I.&G.N. Sur.	Location.
Beck's No. 1 Sullivan, 330 ft. N and E, W½ NW, Sec. 135, Blk. 3, I.&G.N. Sur.	S.D. 400 ft.
Brown et al's No. 1 Duncan, 330 ft. S and E, NW, Sec. 93, Blk. 3, I.&G.N. Sur.	Rigging up.
Cockrell-McIlroy's No. 2 Allam, 330 ft. N and W, E½ NE, Sec. 127, Blk. 3, I.&G.N. Sur.	Standardizing 2,595 ft.
Cockrell-McIlroy Oil Co.'s No. 1 Harbaugh, 1,263 ft. N, 330 ft. W, Lot 182, Sec. 114, Blk. 3, I.&G.N. Sur.	Drlg. 2,744 ft.
Continental Oil Co.'s No. 1 Brown, 330 ft. S and W, Sec. 115, Blk. 3, I.&G.N. Sur.	S.D. 3,245 ft; 1,800 ft. oil in hole.
Cree & Hoover's No. 1 Wright, 330 ft. N, 1,000 ft. E, Sec. 12, Blk. 3, I.&G.N. Sur.	Location.
Kewanee O. & G. Co.'s No. 3 Arnold, 330 ft. N and E, SE, Sec. 149, Blk. 3, I.&G.N. Sur.	S.D. 2,702 ft.
Danciger O. & R. Co.'s No. 1 McLaughlin, 330 ft. S and E, NW, Sec. 33, Blk. B-2, H.&G.N. Sur.	S.D. 2,916 ft; testing; swbng. 5 bbls. oil per hr.
Dulaney & Word's No. 1 Morse, 330 ft. S and W, Sec. 18, Blk. A-9, H.&G.N. Sur.	Rigging up.
Empire G. & F. Co.'s No. 2-B Archer, 330 ft. S and E, SW, Sec. 139, Blk. 3, I.&G.N. Sur.	Fishing 2,582 ft.
Empire G. & F. Co.'s No. 1 Bell, 1,320 ft. S, 1,660 ft. E, SW, Sec. 111, Blk. 3, I.&G.N. Sur.	Location.
Empire G. & F. Co.'s No. 1 Cantrell, 330 ft. S and E, Sec. 136, Blk. 3, I.&G.N. Sur.	Rigging up.
Empire G. & F. Co.'s No. 1 Froshier, 1,320 ft. S and E, Sec. 177, Blk. 3, I.&G.N. Sur.	Location.
Empire G. & F. Co.'s No. 1 Sullivan, 330 ft. NW of E 64 ac. of W 104 ac, of S 264 ac., of N½, Sec. 136, Blk. 3, I.&G.N. Sur.	Drlg. 1,295 ft.
Empire G. & F. Co.'s No. 2 Sailor, 330 ft. N and W, NE, Sec. 138, Blk. 3, I.&G.N. Sur.	Standardizing 2,574 ft.
Jean Pet. Co.'s No. 1 Furneaux Bros., 330 ft. N and W, cor. SE, Sec. 200, Blk. B-3, H.&G.N. Sur.	S.D. 2,760 ft.
Magnolia Pet. Co.'s No. 1 Latham, 876 ft. N, 150 ft. E, Sec. 153, Blk. 3, I.&G.N. Sur.	Drlg. 550 ft.
Magnolia Pet. Co.'s No. 1 Heithold, 150 ft. S, 1,156 ft. W, SE, Sec. 152, Blk. 3, I.&G.N. Sur.	Location.
Magnolia Pet. Co.'s No. 2 Latham, 175 ft. N, 150 ft. E, Sec. 153, Blk. 3, I.&G.N. Sur.	Bldg. rig.
Magnolia Pet. Co.'s No. 3 Sailor, 330 ft. S and W, E½ NE, Sec. 138, Blk. 3, I.&G.N. Sur.	Bldg. rig.
Midwest Explin. Co.'s No. 1-B Taylor, 660 ft. N and W, Sec. 7, Blk. H, A. W. Willard Sur.	Spudding.
Midgray Oil Co.'s No. 1 McCullough, 267 ft. N, 150 ft. E of 246.9 ac. in Sec. 153, Blk. 3, I.&G.N. Sur.	Spudding.
Nelson et al's No. 1 Crews, 330 ft. S and E, NW, Sec. 12, Blk. 25, H.&G.N. Sur.	Fishing for bit; T.D. 2,611 ft.
Operators R. & P. Co.'s No. 1 Arnold, 330 ft. S and E, E½ NE, Sec. 149, Blk. 3, I.&G.N. Sur.	Standardizing 3,143 ft.
Phillips Pet. Co.'s No. 1 Barrett, 330 ft. S, 150 ft. W. W½, N 56 ac., Sec. 1,360, Blk. 3, I.&G.N. Sur.	Rigging up.

(Continued on Page 111)

NORTH TEXAS PRODUCTION
Week ending October 11

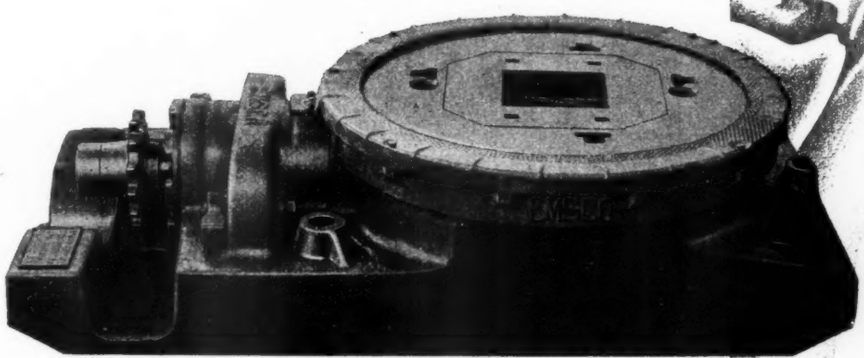
Panhandle District—	Bbls.
Carson County	7,095
Hutchinson County	15,820
Gray County	55,270
Moore County	560
Potter County	None
Wheeler County	555
Total production this week	79,300
Total production last week	78,274
Increase	1,026
Wichita Falls District—	
Archer County	13,769
Baylor County	1,063
Clay County	635
Cooke County	3,098
Foard County	149
Jack County	2,066
Haskell County	41
Montague County	6,227
Throckmorton County	692
Wilbarger County	16,922
Wichita County	23,429
Young County	10,762
Total production this week	78,903
Total production last week	76,498
Increase	2,405
Ranger District—	
Brown County	5,566
Callahan County	2,920
Coleman County	2,352
Comanche County	1,083
Palo Pinto County	487
Eastland County	4,265
Shackelford County	5,428
Stephens County	5,470
Total production this week	27,571
Total production last week	27,200
Increase	371

SHUTS OUT MUD AND WATER

EMSCO

TYPE H 27½"

TOTALLY ENCLOSED ROTARY



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CONTINENTAL

Pipe Line Construction News

MISSISSIPPI MERGER IN EXPANSION PROGRAM

The most extensive transfer of utility companies in the history of Mississippi has just taken place with the sale of the gas distribution systems of Columbus, Hattiesburg and Meridian to the Mississippi Public Service Co. The latter company, recently organized, is headed by E. C. Deal as president with W. Rawson Collier, vice president and general manager.

In addition to the acquisition of the three properties, the Mississippi Natural Gas Corp., the Amory Natural Gas Co. and the Mississippi Gas Co.—the latter owning the Laurel plant—will be merged with the Mississippi Public Service which will operate the properties. The other operations coming under the direction of Mr. Collier include gas distribution systems in West Point, Macon, Starkville and Louisville, constructed and heretofore owned by the Mississippi Natural Gas Corp.

The Mississippi Public Service Co. will take over also the system now under construction at Tupelo and will construct plants in Aberdeen, Okalona, Pontotoc and perhaps other towns in northeast Mississippi. The new company is associated with the Southern Natural Gas Corp.

At the present time the new owners are causing the construction of a natural gas line from Amory to Tupelo, and are also furnishing funds for the further exploration of the gas fields near Amory. The complete development of the Amory gas fields is the program of the new owners.

In announcing the merger of the gas properties in Mississippi, it is stated that for the present time the systems will be operated under their present corporate names, bust just as soon as the details can be worked out the companies will be dissolved and the entire group of distribution systems will belong to the Mississippi Public Service Co., with Mr. Collier in charge of the operations.

At this time natural gas from the transmission lines of the Southern Natural Gas Corp. are serving all of the plants taken over except Laurel and Hattiesburg. In the latter cities it is expected that natural gas will also displace manufactured gas at a very early date.

It is stated that the new company will cause rapid extensions of mains in all of the cities for the purpose of making natural gas available for as many consumers as possible.

OKLAHOMA PIPE LINES

Trunk and branch pipe lines owned in Oklahoma by oil companies, handling oil from state fields, represent an investment of $158,877,299, according to A. I. Thompson, engineer with the State Corporation Commission.

Thirteen companies have 7,670 miles of branch and gathering lines in state fields, with operation of 10,612 miles of main trunk lines carrying oil to the Gulf of Mexico or eastern destinations.

Largest interest is that of the Prairie Pipe Line Co., with 4,159 miles of trunk lines and 1,360 miles of branch lines, valued at $36,624,104. Other large companies and the value of their lines are: Gulf, $10,842,235; Shell, $14,164,154; Magnolia, $19,820,184; Sinclair, $23,573,302; Empire, $6,114,539; Texas, $7,713,179; Oklahoma, $23,254,767; Continental Oil, $4,688,682; Texas Empire, $3,525,541; Pierce and subsidiaries, $1,354,343, and Continental, $931,310.

YOUNGSTOWN'S PLANT NOW IN OPERATION

By B. E. V. Luty

PITTSBURGH, Pa., Oct. 13.—Youngstown Sheet & Tube Co.'s new department to make electric weld pipe, put in commercial operation about the first of the month, is working successfully, but as usual, with an entirely new departure, is not yet up to expected capacity, about five miles daily. It is producing 18-inch pipe, against the order placed by the Central Public Service Corp., for a gas line from eastern Kentucky to central Indiana points, involving 260 miles or more. As reported a couple of weeks ago, the company booked 150 to 175 miles of 12-inch seamless, 49½ pounds per foot, from the Sinclair Consolidated Oil Co.

Quite a number of natural gas pipe line projects remain on foot. Laying might be started in the South, but some of the projects involve West Virginia and Kentucky gas.

For a couple of weeks or so there was a little heavier flow of orders in standard pipe, but there has since been a decrease, and in a general way, movement does not appear to be heavier than in August. Prices are reported to be maintained very well, which gives pipe quite a distinction among steel products as many have had an irregular market of late. Sheets, for instance, of which there are many producers, got down around the cost line long ago, and an effort instituted early in September to firm up the market has had little success. The chief question is whether it stiffened and then slipped again, or just stayed as it was. The usual course in tin plate in the past has been for a season price to be announced about November 15, this holding for the year. There was so much shading in August and September that the American Sheet & Tin Plate Co. (Steel Corp.) formally announced a reduction from $5.25 to $5 per base box, 100 pounds, representing an average reduction of close to $5 per net ton.

LONG GAS LINE IN EUROPE

Plans for the development of the natural gas reserves in eastern Europe were revealed with the announcement that the Ruhr Gas Co., together with its pipe line manufacturing subsidiary, has joined with the French company, Societe d'Enterprise de Canalisation, to form the Compagnie Internationale des Canalisation.

The new company, which will be organized in the near future, will proceed shortly with the construction of a long distance transmission line to distribute natural gas from the fields situated in Polish Upper Silesia.

The Ruhr Gas Corp. claims to be the pioneer long distance gas transmission company in the world. It owns a system of 185 miles which has been in existence over 15 years and is completing a new network of 335 miles. These lines deliver principally manufactured gas from the Ruhr area.

PIPE LINE HEARING

CHICAGO, Oct. 13.—Hearing before Illinois Commerce Commission on the application of Panhandle Illinois Pipe Line Co. for a certificate of convenience and necessity to operate a natural gas pipe line in the State has been continued to October 21. The Panhandle Co., which is owned by the Missouri-Kansas Pipe Line Co. and the Columbia Gas & Electric Corp., has reached agreements with Illinois Power Co. and Central Illinois Light Co., whereby the latter two companies will purchase natural gas from the Panhandle Co. at wholesale rates.

REPORT HUMBLE MAY LAY LINE TO VAN POOL

FORT WORTH, Tex., Oct. 13.—Unconfirmed reports state that the Humble Pipe Line Co. is contemplating laying a welded 10-inch line from the Van Pool, Van Zandt County, extending into Louisiana, and will enter the Van Field as a purchaser, making the second line from the field. The Pure Oil Co. now has a 10-inch line running from the field to Smiths Bluff on the Gulf Coast and is running around 27,500 bbls. per day from the field in accordance with the daily allowance of that amount as recommended by the Railroad Commission. If the second line becomes a reality it will probably draw oil from the area to the east of the unitized area, in the Carroll district where the Humble Oil & Refining Co. owns the majority of the acreage, although The Texas Company has one lease, on the G. W. Carter 171-acre farm, on which there is one producing well.

Another line in the pool may add to proration problems of the State, for the Van Field has been granted a daily allowance of 27,500 bbls. One line can run this amount and another line drawing on production will no doubt call for more oil, and raise the daily production and runs from the field. Due to the fact that the oil in this field is not far distant from refineries and Gulf ports, it may be exceedingly desirous.

TAX ON PIPE LINES HELD UNCONSTITUTIONAL

WOODVILLE, Miss., Oct. 11.—A case that attracted interest throughout Mississippi and elsewhere was heard in New Orleans before a three-judge Federal Court composed of Judges Rufus E. Foster of Louisiana, Edwin R. Holmes and Allen Cox of Mississippi, who granted an interlocutory injunction to Interstate Natural Gas Co., Inc., and against the State Tax Commission and Attorney-General of Mississippi. The effect of the decree of the court is that the privilege tax law of 1930 of Mississippi violates the commerce clause of the Constitution of the United States and is unconstitutional in attempting to place a privilege tax on the pipe line of complainant that is engaged in interstate commerce. Interstate Natural Gas Co., Inc., was represented by David C. Bramlette of Woodville, Miss., who argued the case before the Federal Court in New Orleans on behalf of the company. The State Tax Commission and Attorney-General of Mississippi were represented by Assistant Attorney-General E. R. Holmes, Jr. The other sections of the privilege law of 1930 are not affected by this decision.

The case of the Interstate Natural Gas Co., Inc., was instituted before Judge Edwin R. Holmes in Mississippi and under the requirements of the federal law, because of the constitutionality of a state law being involved, it was necessary for Judge Holmes to call to his assistance in the hearing of the case Judges Foster and Cox, Judge Foster being a member of the Circuit Court of Appeals of the United States that holds some of its sessions at New Orleans.

The case will eventually be decided by the Supreme Court of the United States.

BRIDGE FOR PIPE LINES

FORT WORTH, Tex., Oct. 13.—Contract has been let by the Lone Star Gas Co. to a construction company in Dallas for erection of a steel and concrete bridge across the Red River near Sivells Bend, which will be used to carry two natural gas pipe lines, replacing the lines which have been in the river bed. Sixteen-inch gas mains, carrying gas from Oklahoma fields to cities in Texas, will cross on this bridge, which will be 1,200 feet long.

GAS LINE TO ELWOOD READY IN NOVEMBER

Rio Grande Oil Co., jointly with the Barnsdall Corp., has signed a contract with Southern Counties Gas Co., a subsidiary of Pacific Lighting Corp., calling for delivery of Elwood dry natural gas starting November 14, 1930. The volume of gas to be delivered varies during the first three years from a minimum of approximately 2,590,000,000 feet the first year to 3,178,000,000 the second year and 3,178,000,000 the second year and 3,626,000,000 feet the third year and throughout the remainder of the life of the 10-year contract.

The territory which will consume this gas includes Santa Maria, Lompoc and Santa Barbara in Santa Barbara County, Ventura and southern California. The potential gas market in Santa Barbara County is approximately 5,500,000 feet a day. Ventura will consume little of this new supply while the remainder will be marketed in Los Angeles and surrounding territory.

There is a complete network of pipe lines in existence which connects all these cities, but which are of insufficient diameter. A 6-inch line connects Santa Barbara and Ventura, but it cannot take the added load of several millions feet of gas. To remedy this a 32½-mile pipe line of 16-inch diameter is being laid by Southern Counties Gas Co. from Goleta, west of Santa Barbara, to Ventura and will be completed early in November at an estimated cost of $620,000. This line is to lead directly into the two existing pipe lines from Ventura to Los Angeles. One of the two lines is a 12-inch pipe line owned by Southern Counties Gas Co., while the other line is made up of a 15-inch pipe line owned by the Ventura Fuel Co. connecting Southern California Gas Co.'s 12-inch line at a point a few miles east of the Los Angeles-Ventura Counties boundary line.

The new 16-inch pipe line is connected with the Rio Grande-Barnsdall Elwood absorption plant by an 8-inch line between that field and Goleta. From Elwood north to Orcutt, Santa Barbara County, there is an 8-inch pipe line which connects up with the Santa Maria Gas Co.'s supply line of the same size. The line, from Elwood, also supplies dry natural gas to Lompoc. Rio Grande handles about 40,000,000 feet of gas daily at Elwood, of which approximately 70 per cent is from Rio Grande-Barnsdall wells.

NEW LOUISIANA LINES

SHREVEPORT, La., Oct. 13.—Two pipe lines, proposed for immediate construction, will make the output of the newest gas field in northern Louisiana available for commercial use. The Texas-Louisiana Pipe Line Co., subsidiary of the United Gas Co., has completed surveys of the right of way for 13 miles of 14-inch line to the 5,500,000-foot gasser in the Trinity, the deepest commercial well in Louisiana soil.

The Triangle Drilling Co., Louisiana Gas & Fuel Co., and the Standard Oil Co. of Louisiana are completing plans for a gasoline extraction plant and pipe line from the recently opened Sugar Creek gas field in Claiborne Parish, 18 miles southeast of the old Homer oil field.

PAMPA GATHERING LINE

Cities Service Gas Co. announces plans for the construction of a 16-inch gathering line in the west side of the Burnett Ranch near Pampa, Tex. The line, which will be 4¾ miles long, will extend in a northwesterly direction and will tie in with the company's main 20-inch line leading from the field.

FARRAR & TREFTS

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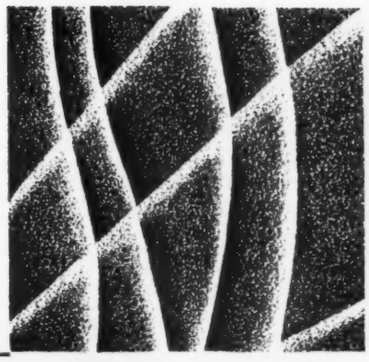
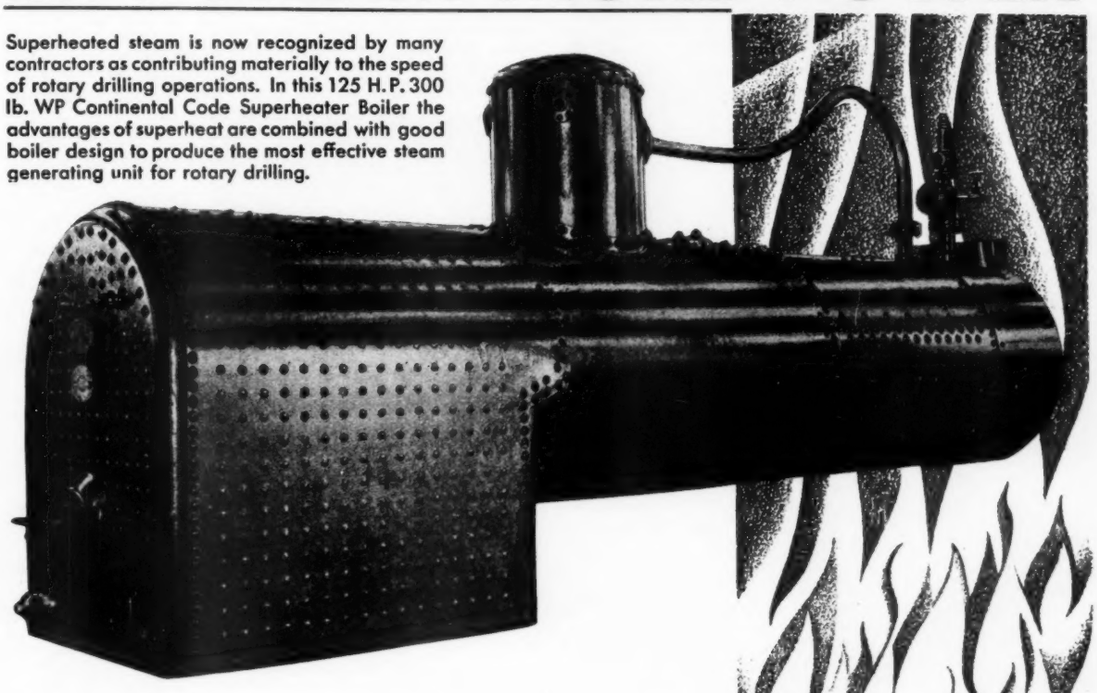


DRY STEAM-MORE POWER

Superheated steam is now recognized by many contractors as contributing materially to the speed of rotary drilling operations. In this 125 H.P. 300 lb. WP Continental Code Superheater Boiler the advantages of superheat are combined with good boiler design to produce the most effective steam generating unit for rotary drilling.



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CONTINENTAL

Oil Men Discuss Problems of Industry

Weaknesses in the Producing and Marketing Divisions Emphasized at Mid-Continent Association Meeting

By James McIntyre

The necessity for long-continued proration of crude oil production; the peril threatened by the Kettleman Hills Field in California; the discounting of the importance of oil shale deposits in this country, and the need for a better system of marketing gasoline in the United States were all subjects of discussion by noteworthy speakers at the thirteenth annual banquet of the Kansas-Oklahoma division of the Mid-Continent Oil & Gas Association in Tulsa on Wednesday, October 8. The division held its annual meeting earlier in the day and elected a new board of officers for the coming year. The banquet was held in the Hotel Mayo in the evening and was largely attended.

Addresses were made by the retiring president, C. C. Herndon, vice president of the Skelly Oil Co.; John M. Lovejoy, president of the Mexican Seaboard Oil Co., and Dr. John W. Frey, of the Minerals Division of the Bureau of Foreign and Domestic Commerce, Washington, D. C., and the banquet ended with a lively line of talk by "Senator" Ford, noted Michigan raconteur, much sought after as an after-dinner speaker.

Retiring President C. C. Herndon, vice president of the Skelly Oil Co., paid a high tribute to Alvin Richards, chief counsel for the Pure Oil Co., who succeeds him as president of the Kansas-Oklahoma division, and also to Harry H. Smith, for 13 years the Mid-Continent Oil & Gas Association's secretary and counsel, and followed with a review of the year's activities in associational work, devoting most of his speech to the work that has been accomplished in curtailing the enormous potential production of the state to approximate market demand. Mr. Herndon said:

Oklahoma's Conservation Law

"The essence of the Oklahoma law on conservation is that in this state there shall not be deliberate waste of crude oil and if, as a means of prevention, it is necessary to require proportional taking by producers from a common source of supply where the potential production exceeds either the transportation or marketing facilities or the reasonable market demand, then every producer in that pool must limit his taking to his fair proportion of the amount which can be taken from the pool as a whole and utilized without waste. The statute and the orders promulgated by the corporation commission in pursuance of it are supported by every principle of common fairness because they do promote equity as between the producer, large and small, by preventing a disproportionate taking by one to the detriment to others through drainage. Granting that proration is necessary, we know of no more equitable, fair or just method of regulating the production from a single pool than that prescribed by Section 7957 of the Compiled Oklahoma Statutes which has been the corner stone of each of the orders issued by the corporation commission.

"The Mid-Continent Oil & Gas Association believes that if the present condition of potential overproduction of oil in the nation and state is to be of considerable duration, as now appears probable, one of the best services which this association, or any other agency of oil producers, can render to the stabilization of the industry, is to study further and profoundly the constituent elements of equitable proration, with the view to suggesting, from time to time, improvements in the method of applying the principles of conservation. It is believed that such a continued study will make for progress toward perfection in the application of this salutary and indispensable measure for the common good of all.

Necessity of Unitization

"In addition to doing what it may to perfect the principles of proration in this emergency, the Mid-Continent Oil & Gas Association has taken the lead in advancing what it believes to be a more permanent cure for our economic problems, namely, the unitization of oil pools whereby the pool rather than the individual lease may become the competitive

Alvin Richards

Newly elected president, Kansas-Oklahoma Division of the Mid-Continent Oil and Gas Association.

unit in the oil producing business," continued Mr. Herndon.

"It has compiled and issued an admirable handbook explaining the principles of unitization and submitting forms of contracts and accounting procedure. The unitization movement has now spread throughout the United States and is being sponsored by the American Petroleum Institute, the American Institute of Mining and Metallurgical Engineers and other organizations. Although this great fundamental and evolutionary movement is in hardly more than its initial stage of momentum, it is a fact that the principle of unit operation has already been adopted and is being practiced in a number of important pools in the country, and it may safely be said that but for the unitization of these areas, such, for example, as the great Van Pool in Texas, the overproduction situation and its resulting threat of physical and economic waste would be more serious and aggravated than they are today. The leaders of the industry look to unitization as the ultimate solution of our difficulties, but realize also that in the present emergency the continuance of proration is indispensable."

Need of Better Marketing

Dr. John W. Frey, who heads a section of the minerals division of the department of commerce, which devotes all of its time to marketing, directed his address to the need of better domestic marketing conditions in the oil industry.

Dr. Frey said in part:

"The amount of business available in any given area must be fairly constant. There is no evidence available that shows any tremendous gains in the consumption of gasoline during the last few years. And there is no reason to believe that there will be any surprising increase for some time to come. Every sales manager with whom I have talked knows that there is a wild scramble on the part of numerous companies to increase the number of outlets. That a large increase in outlets is not the only way to increase gallonage is indicated by the experience of a company which increased its business 600 per cent in a period of about two years with practically no increase in the number of outlets. That company is doing what many oil companies are failing to do, it is making a very careful market analysis and then acting on it. In a recent editorial in one of the oil magazines, I noticed the statement to the effect that as a prerequisite to the establishing of a new outlet there should be at least a definite knowledge of what gallonage will be required to justify the investment and the maintenance of the station. To know anything less than that seems suicidal, and a great deal more should be known in a well-managed organization. A number of sales managers have told me

C. C. Herndon

Retiring president, Kansas-Oklahoma Division, Mid-Continent Oil and Gas Association.

within the past few weeks that there would be no filling station problems if stocks of gasoline were smaller. There is no escaping the fact that excessive stocks of gasoline have a demoralizing effect on the market.

Should Study Distribution Costs

"I am inclined to believe that much good would come to the petroleum industry if a scientific study were made of distribution costs, the limits of potential gallonage for various areas, the limits of investment for certain gallonage possibilities, the degree to which duplication of service exists, the percentage of stations operating at a loss, and so on.

"Strange as it may seem, few oil companies in the United States have information of the sort indicated, but one hopeful sign is that more and more companies are coming to a realization of the necessity of market analysis of their selling areas.

"As I see the situation from a marketing point of view, there are a number of tendencies evident in the industry.

"1. The integration of producers, refiners and marketers is going on rapidly.

"2. Wonderful advances are being made in production and refining economies.

"3. Little progress is being made in marketing economies.

"4. The oil industry, in general, is not sold on the idea of market analysis.

"In concluding, I should like to say that the Bureau of Foreign and Domestic Commerce has handled marketing problems for a number of industries, and if the oil industry ever decides that a co-operation survey for filling stations is desirable the bureau could be of assistance. I should add that the bureau has never undertaken any work of this sort, except at the request of industry, and then only with its indorsement and co-operation."

Problem of Kettleman Hills

John M. Lovejoy spoke on "Real and Imaginary Problems." Kettleman Hills in California, according to Mr. Lovejoy, was the real problem. The fate of the shale deposits in Western United States was the industry's imaginary problem. Mr. Lovejoy said:

"I have just completed a two months' study of that district in the interests of my company, and during that time I have inspected all the producing leases in that field. As a result, I say that if the problem presented by Kettleman Hills is not properly solved, the future of the oil industry cannot be viewed without apprehension. Co-operative methods among operators, not only in California, but in all fields, is the one great factor that will return the oil industry to a prosperous condition, and so aid in the general revival of business.

The Kettleman Hills Field is in the

Harry H. Smith

Secretary-Treasurer, Kansas-Oklahoma Division, Mid-Continent Oil and Gas Association since its organization in 1917.

form of an anticline, with an extent of 13 miles, and comprises approximately 14,000 acres. Although only eight wells are actually producing oil at this time, a sufficient number have been drilled, and the producing horizon has been tested so that we can fairly assume the entire 14,000 acres is proven oil land. The producing sand, insofar as it has been tested, is at least 1,400 feet thick. It lies in a great blanket over this vast geologic structure at depths of from 6,000 to 8,000 feet below the surface.

"If the old competitive methods are to be followed, this field will swamp the industry with crude oil and the worse than unnecessary development will involve a wholly uneconomic investment of capital. The cost of drilling this one

(Continued on Page 138)

Unit Plan Proposal at Kettleman Hills

Potentialities So Enormous That Unitization Seems the Only Logical and Economical Method of Operation

By Robert C. Patterson
Supervisor of Oil and Gas Leasing Operations, Pacific District, Taft, Calif.*

After nearly two years' experience in the North Dome of the Kettleman Hills oil field, California, the operators are now showing a more favorable sentiment toward a unit plan of operation. The Department of the Interior contributed to this change of attitude by urging upon the holders of government permits the adoption of the articles of agreement of July 25, 1929.

This agreement granted to the permittees the right to complete "discovery" wells under certain conditions and provided that government leases would thereafter issue only with the understanding that further drilling would be deferred and production postponed until July 1, 1931. It was intended by this measure to carry out the department's policy of conservation by insuring the orderly and economic development of lands within the North Dome of the Kettleman Hills Field. This agreement further stipulated that, in view of the department's policy of oil conservation, the parties interested in the Kettleman Hills should undertake, by the appointment of a representative committee or other means, to consider a plan of unit development or co-operative method of developing this great structure with maximum recovery and utilization of its resources at a minimum of operating cost. The Secretary of the Interior approved this agreement November 22, 1929, after the signatures of parties interested in government permits had been obtained, and thereby on his part undertook to seek the legislative amendments to the leasing law necessary for adoption of a unit plan including government leases.

Committees and Plans

In February, 1930, the signers of the Kettleman Hills agreement elected a committee, to be known as the Kettleman North Dome Committee, which was to study plans for unit development and co-operative production in the North Dome, in order that proper plans might be submitted to the interested parties, and to consider matters pertaining to uniform operations and the restriction of production in the North Dome. In March, 1930, two plans were submitted by an engineering committee appointed to draw up plans for the development of the North Dome; namely, "Unit plan for Kettleman Hills Field" and "Outline of the co-operative plan for development of the North Dome of Kettleman Hills." When these plans were submitted to the North Dome Committee for consideration and discussion, opinions on their respective merits were found to be so diverse that all parties interested were requested to file briefs setting forth their individual views. The unit plan is looked upon by the operators as the more practicable, and this plan is now being considered by the Kettleman North Dome Committee for modification and revision.

Unit Plan for Kettleman

The unit plan as submitted in March contemplates the formation of a non-profit corporation, to be known as the Kettleman Hills Oil Operators' Association, to be operative for a period of 30 years unless terminated at an earlier date by unanimous vote. The leasehold interests being complicated, this plan seemed more practicable than the ordinary unit plan as developed in other areas. Under the terms of the plan, the leaseholder would be required to assure the association that "title to all oil, gas, gasoline, and all other hydrocarbon substances shall be vested, immediately upon its production, in the association, which shall have the right to dispose of all such products provided that it shall first offer to each member his or its pro rata share thereof." One of the most important features of this plan is that all oil, gas or gasoline which upon production becomes the property of the association is to be divided among all members in proportion to their membership interest, regardless of the ownership of the land from which such products are obtained.

The association is to be governed by 11 directors, who in turn will appoint an operating manager to conduct the affairs of the association. The board of directors is to be empowered to drill and operate wells with its own staff or by contract with its members or others, whichever is the cheaper and better practice. An investment and operating fund is to be established by membership fees, the amount of each member's fee to be based upon the area of the member's leasehold within the proved limits of the field.

Any person, firm, corporation, or association operating or having authority to operate land for the development of oil, gas, gasoline and other hydrocarbon substances in the field may become a member of the association upon being elected to membership by the board of directors, by subscribing to the by-laws, executing the operators' agreement, paying the membership fee and granting the association the right to develop, produce and sell oil, gas and gasoline or hydrocarbon substances in accordance with the by-laws. The development of the field is to be conducted in an orderly manner, recognition being given, so far as possible, to the lease and contractual obligations of the members at the date of the incorporation of the association. The members' properties are to be protected against offset development that is not under the control of the association, and wells are to be drilled to establish the productive limits of the field and to supply the market demands.

The association is to purchase all existing wells and equipment within the productive limits of the field necessary to carry on development and operation of the field. Taxes are to be paid only on property owned by the association.

The board of directors is to appoint an engineering advisory committee, not less than nine in number, to serve without compensation during the pleasure of the board. The engineering advisory committee is to make a complete survey of the field, recommend the productive limits, select drilling sites, determine the manner of maintaining and operating the field, recommend the improving of properties and recommend rules and regula-

(Continued on Page 106)

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OFFICERS OF PETROLEUM DIVISION, AMERICAN CHEMICAL SOCIETY

Officers of Petroleum Division of the American Chemical Society elected at the recent annual meeting held in Cincinnati. C. R. Wagner, chief chemist, Pure Oil Co., Chicago, chairman; Frank H. Hall, chief chemist, refining department, Port Arthur, Tex., works, The Texas Company, vice chairman; Charles D. Lowry, Jr., research chemist, Universal Oil Products Co., Chicago, secretary; Dr. J. B. Hill, chief chemist, Atlantic Refining Co., Philadelphia, executive committee; and Dr. Robert E. Wilson, assistant to the vice president, in charge of manufacturing, Standard Oil Co. (Indiana), Chicago, executive committee.

C. R. Wagner

Frank H. Hall

C. D. Lowry, Jr.

Dr. J. B. Hill

Dr. Robert E. Wilson

Effect of Sulphide On Drilling Lines

Conclusions Drawn From Intensive Study of Causes of Premature Failure of Lines. Rapidity of Embrittlement

By Leslie W. Vollmer and Blaine B. Wescott
Research Department, The Gulf Companies, Pittsburgh, Pa.*

One of the most interesting of the many new problems which have arisen during the past few years from the rapid expansion in the production of petroleum has to do with the effect of hydrogen sulphide upon the physical properties of steel. The Petrolia Pool in Ontario developed in 1868, was among the first of the sulphide fields. This was followed by others, among which were Trenton, Spindletop, El Dorado, Kansas and the Panhandle. It was soon recognized that corrosion of well equipment, gathering lines and tanks was more rapid in these fields than in the nonsulphide fields, and that failures of parts subjected to repeated stresses while in contact with the gas and oil were somewhat more numerous than usual.

However, it was not until the extensive development of West Texas in 1926, with its gas containing up to 15 per cent by volume of hydrogen sulphide, that its effect on steel was fully recognized. It was manifested by premature failures of apparently sound cable tool drilling lines after but a few hours' service in the pay horizon. The lines became exceedingly brittle; so much so that very often the individual wires could not be bent through an angle of 90° without breaking. Nearly all of these embrittled fractures had a characteristic jagged appearance without any necking, as contrasted to the relatively smooth break of unembrittled, fatigued wire or the smooth diagonal appearance of worn or abraded failures.

It was soon noticed that an embrittled line recovered at least a portion of its original ductility when allowed to remain in the open air for a day or more. This behavior is very similar to that of wire pickled in acid solutions, commonly termed acid or hydrogen brittleness.

The fact has been successfully demonstrated that molecular hydrogen cannot induce brittleness in steel. Atomic or nascent hydrogen, however, rapidly causes brittleness in steel, and it has been generally supposed that the degree of embrittlement was at least roughly proportional to the carbon content. Nascent hydrogen may be generated from the interaction between hydrogen sulphide and steel according to the equation:

$$H_2S + FE \rightarrow FeS + 2H$$

Occlusion of this freshly generated hydrogen by the wire lines results in embrittlement analogous to that produced in pickling operations, the only difference in the two phenomena being in the method of hydrogen generation. The extreme rapidity with which brittleness can be induced, coupled with the observations that the tensile strength is practically unaffected while ductility is decreased and hardness slightly increased, indicates that the effect is largely a surface reaction. The crystalline character of failures resulting from brittleness justifies the opinion that the atomic hydrogen is absorbed by the intercrystalline material, where it combines to form molecular hydrogen with a change in volume which produces severe boundary strains within the metal.

Embrittlement Testing

Because the maximum effect of hydrogen brittleness is at the surface, the most suitable method for its measurement is by a test in which the greatest stress is at the surface, as for instance, a bend test of some nature. The apparatus devised for the purpose was patterned somewhat after a method previously used to study the effect of caustic on boiler plates. The machine consisted of a chuck mounted on a horizontal shaft, motor driven through a single reduction gear unit, and connected to a counter at the end of the shaft opposite the chuck. A 3-inch length of the wire to be tested was fastened in the chuck, while the other end passed through a case-hardened bushing mounted in vertical support whose height and distance from the face of the chuck could be accurately measured and varied at will. Throughout this study wire of 0.064 inch diameter was used. The distance from the face of the chuck to the face of the bushing was 1.25 inches, and the vertical displacement was 0.25 inch. The motor current was controlled by a relay which was actuated by battery current passing through the sample to be tested. Failure of the sample caused the motor to stop.

The number of revolutions to cause failure under these arbitrary conditions was termed rotary endurance, and the ratio of the difference between the rotary endurances of wire exposed to the action of hydrogen sulphide and unexposed wire was called the degree of embrittlement. Thus, embrittlement was measured as the per cent decrease in the number of revolutions caused by the exposure to hydrogen sulphide. In all cases, the results reported were the averages of at least five determinations.

The wire samples were treated with hydrogen sulphide, generated from iron sulphide and hydrochloric acid, in flasks interposed between two bubbling flasks containing water in order to assure an excess of hydrogen sulphide at all times. All wires were cleaned in a cold 20 per cent solution of ammonium citrate, washed in cold water, and dried before use.

The effects of hydrogen sulphide were determined for both cold-drawn and annealed wires of varying carbon contents and for metallic-coated wires. It was found that wire treated with perfectly dry hydrogen sulphide or immersed in water-free crude oil saturated with the gas did not become embrittled. On the other hand, wire treated with gas moistened by bubbling through water or immersed in well brine saturated with hydrogen sulphide rapidly became brittle.

Table 1 gives the analyses and physical properties of the uncoated wires investigated.

Embrittlement of Cold-Drawn Wire

Table 2 gives the results of embrittlement tests made on cold-drawn plain carbon steel wires of varying carbon contents. In most cases, the figures in the table represent the averages of at least three separate experiments under the stated conditions. The variations shown were due to two causes: (1) The rotary endurance test is extremely sensitive to any inhomogeneities in surface conditions or internal composition, and (2) there are greater relative variations in the size and the physical make-up of small wire than in specimens of greater cross sectional area.

TABLE 1—CHEMICAL ANALYSES AND PHYSICAL PROPERTIES OF PLAIN CARBON STEEL WIRES

No.	Chemical analyses: Carbon	Manganese	Phosphorus	Sulphur	Silicon	Tensile strength, lb. per sq. in.: Cold drawn	Annealed
339	0.034	0.030	0.003	0.056	0.017	74,200	39,700
465	0.386	0.340	0.005	0.040	0.209	180,600	65,600
456	0.453	0.680	0.005	0.040	0.176	209,600	79,800
458	0.645	0.580	0.005	0.028	0.239	251,600	86,700
431	0.688	0.630	0.019	0.061	0.256	242,800	92,200
464	0.745	0.530	0.007	0.039	0.145	263,300	92,100
468	0.847	0.330	0.004	0.038	0.260	298,400	103,100
469	0.918	0.450	0.005	0.025	0.195	315,200	100,000

TABLE 2—PER CENT EMBRITTLEMENT OF COLD-DRAWN PLAIN CARBON STEEL WIRES

(a). Wires Treated With Moist Hydrogen Sulphide

Hours exposed	Per cent carbon content: 0.034	0.386	0.453	0.645	0.688	0.745	0.847	0.918
4	....	59.9	54.7	58.0	69.5	58.1	100.0	100.0
8	....	46.4	50.2	45.6	53.8	76.1		
16	....	59.3	50.3	44.4	63.3	79.3		
24	50.5	64.9	47.2	29.4	69.9	48.6		
48	47.8	62.7	45.6	33.8	62.4	45.1	(*)	
72	51.9	62.3	37.8	21.7	59.7	46.7		
96	52.6	60.2	34.9	18.9	56.4	19.5		
120	40.2	54.3	27.7	18.7	53.4	33.5		

*Samples ruptured spontaneously

(b) Wires Immersed in Oil Well Brine Saturated With Hydrogen Sulphide

Hours exposed	Per cent carbon content: 0.034	0.386	0.453	0.645	0.688	0.745	0.847	0.918
4	31.7	48.9	39.4	51.6	59.8	42.7	100.0	100.0
8	31.7	46.5	36.5	47.6	59.5	44.2		
16	45.4	35.0	36.3	37.1	57.2	44.6		
24	69.9	63.2	57.6	44.2	64.4	54.1		
48	70.3	59.8	54.6	40.6	67.9	49.6	(*)	
72	66.8	57.5	48.1	20.4	59.3	28.1		
96	68.9	56.3	47.7	18.1	62.9	36.5		
120	65.5	41.2	37.2	17.1	55.5	11.1		

*Samples ruptured spontaneously

TABLE 3—PER CENT EMBRITTLEMENT OF ANNEALED PLAIN CARBON STEEL WIRES

(a) Wires Treated With Moist Hydrogen Sulphide

Hours exposed	Per cent carbon content: 0.034	0.386	0.453	0.645	0.688	0.745	0.847	0.918
4	64.7	15.5	32.5	12.7	25.2	29.2	18.2	13.0
8	57.7	42.4	40.5	27.0	24.5	32.1	11.2	19.4
16	79.0	15.4*	20.4	16.1	18.7	31.8	7.5	7.6
24	63.4	29.8	30.3	22.9	13.8	15.9	17.2	10.0
48	63.0	34.7	27.5	20.6	12.9	30.9	18.9	8.7
72	60.3	28.3	29.4	17.0	16.0	29.3	18.4	9.6
96	62.8	25.1	15.9	16.8	11.7	21.8	16.5	8.6
120	66.9	18.4	14.9	22.4	20.4	29.1	12.5	6.9

(b) Wires Immersed in Oil Well Brine Saturated With Hydrogen Sulphide

Hours exposed	Per cent carbon content: 0.034	0.386	0.453	0.645	0.688	0.745	0.847	0.918
4	46.6	39.4	35.1	27.9	10.4	32.1	21.7	22.0
8	43.2	16.7	35.3	20.2	26.2	29.5	26.0	27.9
16	64.0	29.0	31.8	29.0	23.1	19.4	31.4	34.4
24	62.0	43.4	44.7	32.5	33.6	33.8	23.4	28.3
48	67.0	33.1	34.9	28.4	27.4	30.3	18.8	23.3
72	67.1	22.5	34.9	19.2	14.4	27.6	18.5	17.0
96	68.2	26.2	27.5	22.5	19.1	28.5	19.3	15.7
120	71.3	14.7	19.5	11.2	14.4	15.8	19.9	14.4

In addition, practically all of the wire used in this investigation was made in small lots especially for this purpose, thus introducing greater differences in uniformity than commonly occur in commercial wire.

The rates of embrittlement were somewhat slower in the samples immersed in brine, although the maxima were practically the same. With each grade of wire a maximum was reached after which the embrittlement decreased. This action was similar to that found with caustic and boiler plate. It may be explained in this instance by the fact that the formation of atomic hydrogen was dependent upon the hydrogen sulphide coming into contact with the steel. As the reaction progressed, a coating of iron sulphide was formed upon the surface of the steel, and the rate of diffusion of hydrogen sulphide into the surface constantly decreased. Finally, this rate of diffusion became less than that of the occluded gas from the steel, and the embrittlement consequently decreased.

The similarity between failures from embrittlement in service and in this investigation was noted. The same angular type of fraction occurred in nearly every instance. The cause of this type of break will be made clear later. The 0.034 per cent carbon wire (ingot iron) behaved in a very irregular manner throughout. If this material is disregarded, there was a qualitative relation between the carbon content and degree of embrittlement—the latter increased as the former. It will be shown later that this was not a true relation. The wires containing more than 0.75 per cent carbon ruptured spontaneously after three hours' exposure to hydrogen sulphide.

In some cases the 0.75 per cent carbon wire also split. The cracks started in a direction nearly perpendicular to the surface of the wire, and after penetrating for about one-third of the diameter, proceeded in a longitudinal direction. The intercrystalline character of the cracks was evident.

It was quite certain from this that the action of the sulphide gas caused rupture by intensifying previously existent internal stresses — quite logically, the stresses engendered by the cold-drawing operations of manufacture. The angular character of the embrittled failures was caused by the tendency to follow these longitudinal lines of internal stress.

Furthermore, it seemed probable that there was no direct relationship between carbon content and degree of embrittlement. The draft or reduction of cross sectional area in cold drawing of wire is very nearly the same for steel of all carbon contents when maximum strength is sought. High carbon steels are less ductile than the lower carbon steels, and when subjected to the same amount of cold work, the internal stresses resulting are much greater.

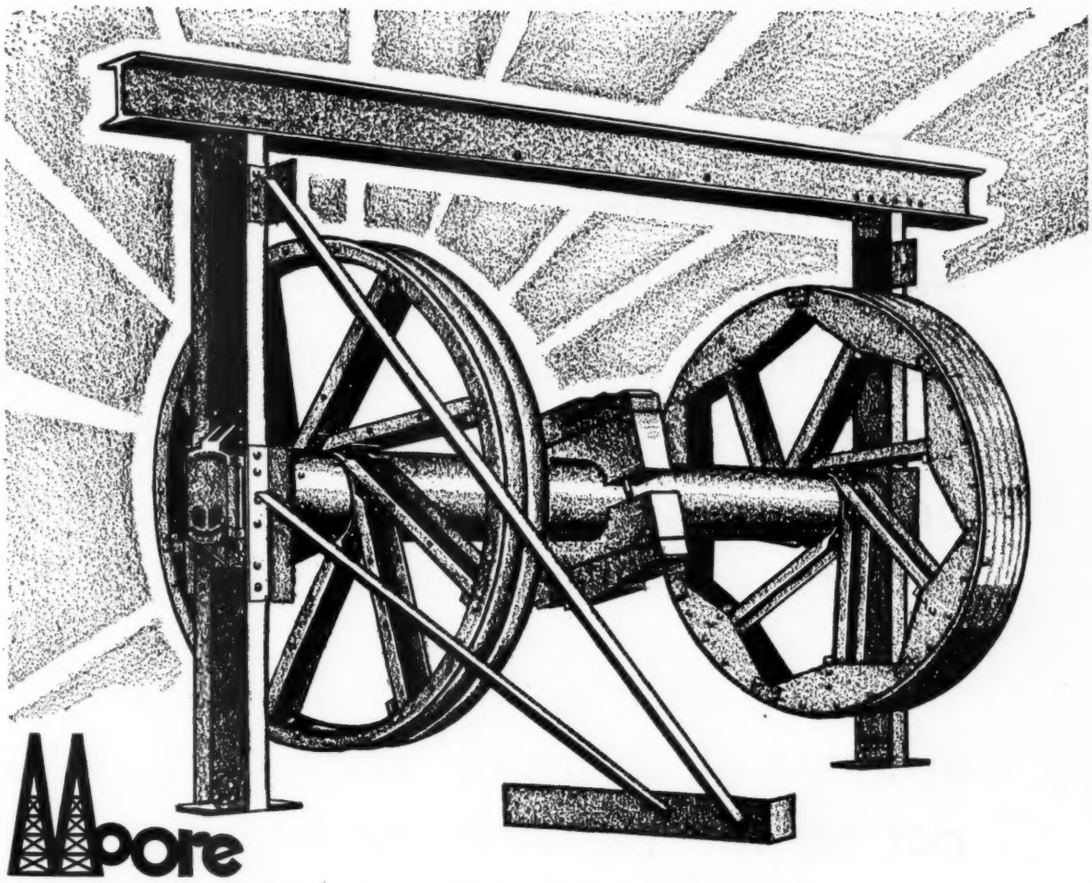
The apparent relation between carbon content and degree of embrittlement was then primarily a relation between internal stress or cold work and degree of embrittlement.

The speed with which hydrogen sulphide can cause embrittlement affords a very interesting line of investigation. This was determined for the 0.688 per cent carbon steel, which was a commercial grade of improved plow steel for drilling lines. The embrittlement increased steadily from 20.4 per cent in 15 minutes to a maximum of 69.8 per cent in three hours. It no longer seems strange that failures occur after a short time in lines exposed to hydrogen sulphide while subjected to severe repeated stresses.

Samples of the same wire were treated

(Continued on Page 141)

*Before Tulsa meeting, Petroleum Division, A.S.M.E., October, 1930.



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Two Wells Drilling Near Wauseon, Ohio

Tests Planned in Northwestern Part of State. Fulton and Williams Counties May Get Play in the Spring

By George A. Whitney
Staff Correspondent. Central West Fields

FINDLAY, Ohio, Oct. 13.—As usual the most active division of the Central West Field is the Central Ohio area where both gas and oil are sought by the operators. Just at present the wildcatter is looking for new possibilities of oil in advance of production, so as to be ready to have something to do early in the spring season. The extreme northwestern part of Ohio is to be given a number of tests, especially in Fulton County, north of Wauseon, the county seat. A well drilled some time ago on the Pfund farm, showed for a small gas well, but was not drilled deep enough for oil. Unknown parties are reported drilling north of Wauseon, on the Mel McConkey farm, and Texas parties are reported to be drilling a deep test on the property owned by Henry Williams and Dora Barnes. Should these wells prove productive, it will mean active operations there in the early spring. In passing through Fulton County over Route 20 highway recently and directly west of Toledo, much attention was paid to the area around Oak Shade and Fayette, as the surface indications looked very favorable for either oil or gas, although no tests have yet been made in that vicinity, nor farther west through Williams County to the Ohio-Indiana State line. The country is quite hilly and looks inviting for test work far away from any known production, and is only a short distance south of the Ohio-Michigan line. The closest known production is near Waterville, in Lucas County.

The only completion reported from the old Lima Field of northwestern Ohio for the week was a dry hole drilled by C. A. and F. J. Peavey on the H. A. Bash farm, Section 25, Delaware Township, Hancock County, at a depth of 1,350 feet. Two wells drilling in Monclova Township, Lucas County, are nearing the sand. They are Dillon & Weed's No. 2 D. C. Teft farm, Section 32, and Dillon & McFrederick's No. 1 on the France Stone Co. land, Section 29.

CENTRAL OHIO

Twenty-six completions were reported from the Central Ohio Field, of which six were producers with an initial of 219 bbls.; six dry holes and 14 gas wells. New work starting shows 9 new locations staked out and 15 wells started spudding, a total of 24.

In Ashland County, Greene Township, the Ohio Fuel Gas Co.'s No. 2-5,261 D. C. Baker farm, Section 3, is reported dry. Same company has a gas well in No. 1-5,217 Ezra Culler farm, Section 30, Vermillion Township. The Kemrow Co. found a dry hole, finding the sand badly broken on the Leroy Shaw farm, Section 36, Clear Creek Township, from 2,493-2,501 feet. Mill and others' test on the Lily Wharton farm, Section 16, Milton Township, same county, was dry in the shallow sand from 583-633 feet. Same parties are drilling on the Leonard Walton farm, Section 22, same township. D'Lano and others are drilling No. 3 Melvin Devault, Section 29, Perry Township, and the Preston Oil Co. made a location for No. 4 M. Devault farm, same section.

In Medina County, Chatham Township, the Oko Oil & Gas Co.'s No. 42 Henry Essig farm, Section 13, Chatham Township, produced an initial of 30 bbls. from the Cow Run sand at 460 feet. In Homer Township, F. E. Barnhart got a fair gas well on the Charles Bernace farm, Section 16, and the Kemrow Co. a good well in No. 2 on the Frank Rader, Section 4, same township, from 2,946-56 feet. Ohio Fuel Gas Co. struck a gas well in No. 2-5,216 M. S. Payne, Lot 70, Harrisville Township, and Barnhart and others made a location for No. 3 on the Joseph Funk, Lot 6, same township. In Westfield Township, the Ohio Fuel Gas Co.'s No. 3-5,290 G. O. Kirk, Lot 59, is reported dry. Same company has a light gas showing in No. 2-4,126 J. W. Shive farm, Section 13, York Township.

Lorain County

In Lorain County no completions were reported, the only change being a location made by the Wiser Oil Corp. on the Terry C. Whitney, Lot 48, Pittsfield Township.

In Wayne County, Ohio Fuel Gas Co. has a gas well in No. 5,289 B. F. Hartman farm, Section 20, Chester Township.

In Richland County, Worthington Township, a dry hole was drilled by the Ohio Fuel Gas Co. in No. 3-5,190 Florence C. Norris, Section 10, there being no sand encountered by the drill.

In Knox County, East Ohio Gas Co. is drilling No. 6 Maude S. Thrasher, Section 28, Brown Township, and Perkins and others are drilling on the Fred Dowds, Section 19, Pike Township, same county.

In Coshocton County, Franklin Township, Ohio Fuel Gas Co. drilled in a gas well in No. 3-5,288 Cornelia B. A. Corey farm, in the third-quarter, at a depth of 2,890 feet.

In Summitt County, Copley Township, a gas well was found by the Ohio Fuel Gas Co. in No. 1-5,240 Paul Spitzer, Section 9. F. A. Brendall and others struck a good gas well in No. 1 R. C. Milner, Section 25, Franklin Township, from 4,076-4,112 feet.

In Licking County, Fallsburg Township, I. C. Robinson's No. 6 Sam Mossholder, Section 14, reported with an initial of 90 bbls. from 3,008-55 feet. McClay Brothers' No. 3 U. G. Porter, Section 13, same township, has an oil showing from 2,998-3,058 feet, but will be given a shot before its value can be determined. Emerald Petroleum Co. is drilling No. 2 C. A. Weakley, Section 13, same township. In Mary Ann Township, the Settles Oil Co.'s second test on the David Wright, Section 3, is a 10-bbl. initial producer, while Armbruster & Stickler's No. 7 William Strickler, Section 23, produced 7 bbls. initial.

Muskingum County

In Muskingum County, Licking Township, Hopewell Gas & Fuel Co.'s test on the Oscar Perry, Section 6, produced 60 bbls. the first 24 hours from the Clinton lime formation at 3,226 feet. Sagle and others landed a nice gas well on the Orin Perdew, Section 4, Brush Creek Township, from 4,052-75 feet. The Atha Co. staked a location for No. 1 L. M. Bryan, Section 22, Perry Township, and the Pure Oil Co. is drilling No. 3 A. P. and J. W. Rush, Section 17, Harrison Township.

In Athens County, Berne Township, Ohio Fuel Gas Co.'s No. 2-5,214 C. O. Grimes, Section 36, is a gas well in the Berea sand at 1,367 feet. Same company has a gas well in No. 2-5,305 W. B. Barnhill, Section 25, Carthage Township, in the Maxon sand from 1,220-25 feet. Whitmer and others are drilling No. 1 Henry B. Schall, Section 24, York Township.

In Tuscarawas County, Washington Township, Gordon Oil Co. is drilling No. 4 Thomas B. and Rose Shearer, Lot 34, and the Wehrle Co. is going deeper in its No. 1 Warner & Sundheimer, Section 16, Bucks Township, which was held up for a while at 1,084 feet to test it out.

In Guernsey County, Wheeling Township, Ohio Fuel Gas Co.'s No. 3 Amanda E. Robinson, Section 12, reported at 20 bbls. initially from 3,425-37 feet. No. 4-1,449, same farm, is drilling. Hopewell Oil & Gas Co. is drilling No. 3 F. L. Euga, Section 8.

In Belmont County, Somerset Township, A. C. Peters and others have a gas well in No. 2 William T. Lane, Sections 20 and 26, at from 1,032-35 feet. William C. McBride found a gas well in No. 3 Howell-Dement farm, Section 1, same township. Charles Rice struck a duster in No. 3 on the C. H. and M. Rice, Sections 12 and 18, Goshen Township, same county.

INDIANA

Completions are slow over the Indiana Field, there being but one completion reported which is the Ohio Oil Co.'s No. 1 in the southeast corner of the Mabel Prevo farm, SE NW, Section 32-Prairie Creek Township, Vigo County, and in the Siosi Pool, which produced an initial of 51 bbls. from a total depth of 2,222 feet.

The second test of Mason and Chanley on the D. S. Gaither farm, Section 28, Boone Township, Crawford County, struck gas in the Corniferous formation in the Trenton at a total depth of 2,400 feet and is going deeper in hopes of getting a pay in this formation. Louisville Cement Co. is drilling on the Speed farm, same county.

There is no report from the wildcat drilling by the Mich-Ohio Oil Co. on the Brenneman farm, in Monon Township, White County, and in the western part of the Kankakee Valley toward the Illinois State line from the shallow fields in that part of the State.

Hamilton, Atwater & Sharpe are drilling No. 1 on the Bretz farm, in Spencer County, in the southern part of the State. In the southern boundary of Indiana, slowness is shown in bringing in wells that have been under way for a long period. No report has been made of the drilling well by the Lagrange Oil & Gas Co. on the Claire Shoup farm, in Clay Township, Lagrange County, just south of the Michigan border. The Rickow & Graf test on the Martha Adams farm, Section 9, Monroe Township, Randolph County, is about due for completion, as is the Hoosier Drilling Co.'s No. 1 Mutchman, near Huntingsburg, in Dubois County. There are two wells in Knox County, the Shell Petroleum Corp.'s No. 1 John Elison, Survey 11, and the Gardner Petroleum Co.'s No. 2, located north of the town of Decker. Vandeburg Oil Co. is working on the George Hornby lease, near Stringtown, in Vandeburg County.

ILLINOIS

No area of Illinois is showing any activity to mention, although now and then a completion or so is made. The best well since the previous review was found in the Allendale Field, by Snowden-McSweeney interests in No. 9 on the Sarah E. McMillan farm, NE Section 9, which produced an initial of 75 bbls. from 1,452-90 feet, known as the Biehl sand. The well is 600 feet from the south line and 200 feet from the east line of the lease. Robinson Oil Co.'s No. 4 well, 1,200 feet from the south line and 200 feet from the east line of the Hattie E. Robinson farm, NE Section 15, same township, pumped 8 bbls. initial from 1,460-1,500 feet. J. D. Toomey and others are drilling No. 12 Harrison Buchanan farm, Section 10, and the Highland Oil & Gas Co. is starting No. 5 J. M. Mullinax farm, Section 5, all in Wabash Township.

In the old Casey Field, on Parker Prairie, in Parker Township, Clark County, Charles Karns and others found a dry hole in the northeast corner of the N. Cunningham farm, NE Section 36, at 700 feet, and R. E. Moffet and others' No. 36 in the northwest corner of the E. and H. F. Pinnell farm, SE Section 5, same township, produced 1 bbl. initial at 467 feet. Same parties are drilling No. 7 Hattie L. Briscoe farm, Section 32, and Associated Producers Co. is drilling No. 54 on the A. E. Dorsey, Section 7, same township. The Casey Field is a shallow sand producer and many large wells were found at less than 500 feet and the shallow area also took in Union Township, Cumberland County, where large production was found, and thousands of wells were drilled in the two counties about 1907. Many of these old wells are still producing a little oil daily.

HART COUNTY WELL ESTIMATED AT 1,000 BARRELS IF WIDE OPEN

By George A. Whitney

OWENSBORO, Ky., Oct. 13.—About the only excitement in Kentucky at this time is centered around the well recently brought in by Norris & Davis on the Lewis McKinney farm, several miles east of Horse Cave, in the southeast corner of Hart County. This well was rated around 1,000 bbls. in 24 hours if allowed to flow its full capacity, but was pinched in and made 10 bbls. an hour. The well only one-third open has produced within a very few days 23 tanks of crude with 100-bbl. capacity and is still going strong. This looks like a big pool having all the indications of being three times as big as was the Lecta Pool to the south in Barren County. Reports are that Davis & Norris have laid a line from the well to Horse Cave on the L.&N. Railroad, and that the oil is to be taken by the Stoll Oil Refining Co. and shipped by tank cars to Louisville. Norris & Davis in drilling their No. 1 on the Nannie McKinney farm, near Seymour, struck a heavy gas volume at 480 feet, and deeper drilling may bring forth a larger gusher, as the big flow of oil on the Lewis McKinney was found at 600 feet.

Across the line from the McKinney well, the Consolidated Utilities Co. drilled in a 2,000,000-foot gas well in No. 1 on the Jameson farm in Metcalf County. Norris & Davis are drilling No. 1 Mitt Richardson farm, and No. 1 Harry Perkins farm, also near Seymour in Hart County. These wells make the extreme northeastern part of Barren County look very good for both oil and gas, and the old Glasgow Field may have another boom as of a few years ago.

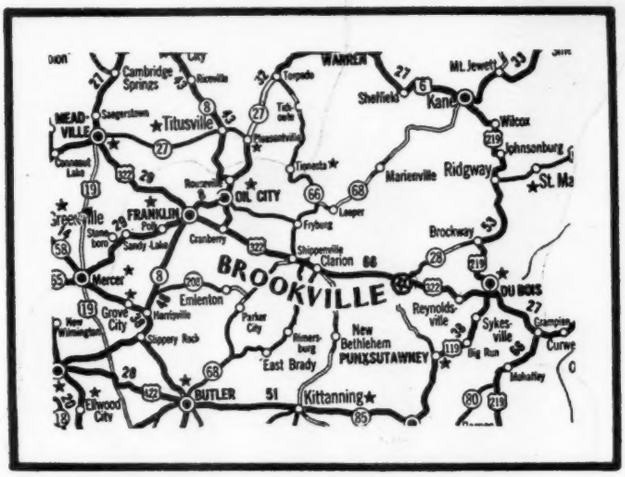
Southeastern Gas Well

Another large gas well has been added to the Kentucky territory but is in the southeastern portion of the State, where the Distill-Martin Gas Co. hit one on the Helton land, 5 miles or so out of Barbourville, that is reported showing better than 5,000,000 initial volume and makes Knox County loom as a large gas producing area. The Helton well was drilled to a depth of 1,480 feet, and is the second good gas well on the same property.

Completions are few in the Owensboro Field as the shutdown movement still prevails and may continue for an indefinite time. Some of the operators are doing a little development work in Ohio,

(Continued on Page 166)

* The BROOKVILLE, PENNSYLVANIA Area



In the year 1866, Messrs. Michael Best, W. J. McKnight and Captain Steck, drilled a well for oil along Sandy Lick Creek in Winslow Township, but at a depth of 900 feet encountered gas and salt water. Being unfamiliar with the use of gas at that time, it was not utilized, but was permitted to burn as a torch and is still burning as such. Various other gas wells have since been drilled to the 900-foot depth and have proved to be good commercial gas wells.

The first real gas well was drilled in 1884, on the bank of Red Bank Creek, the location now being in the center of Brookville. This sand was found at 2700 feet, and was known as Bradford sand. The first oil well in this area was brought in on October 22nd, 1895, by the Standard Oil Company, with initial production of twenty-five barrels per day, this well being located on Lathrops Land, on Callen Run, in Heath Township, production being encountered at 1609 feet. Gas wells are found in sands extending from 2700 to below 3,000 feet, and range in volume from 50,000 to 300,000 cubic feet per day.

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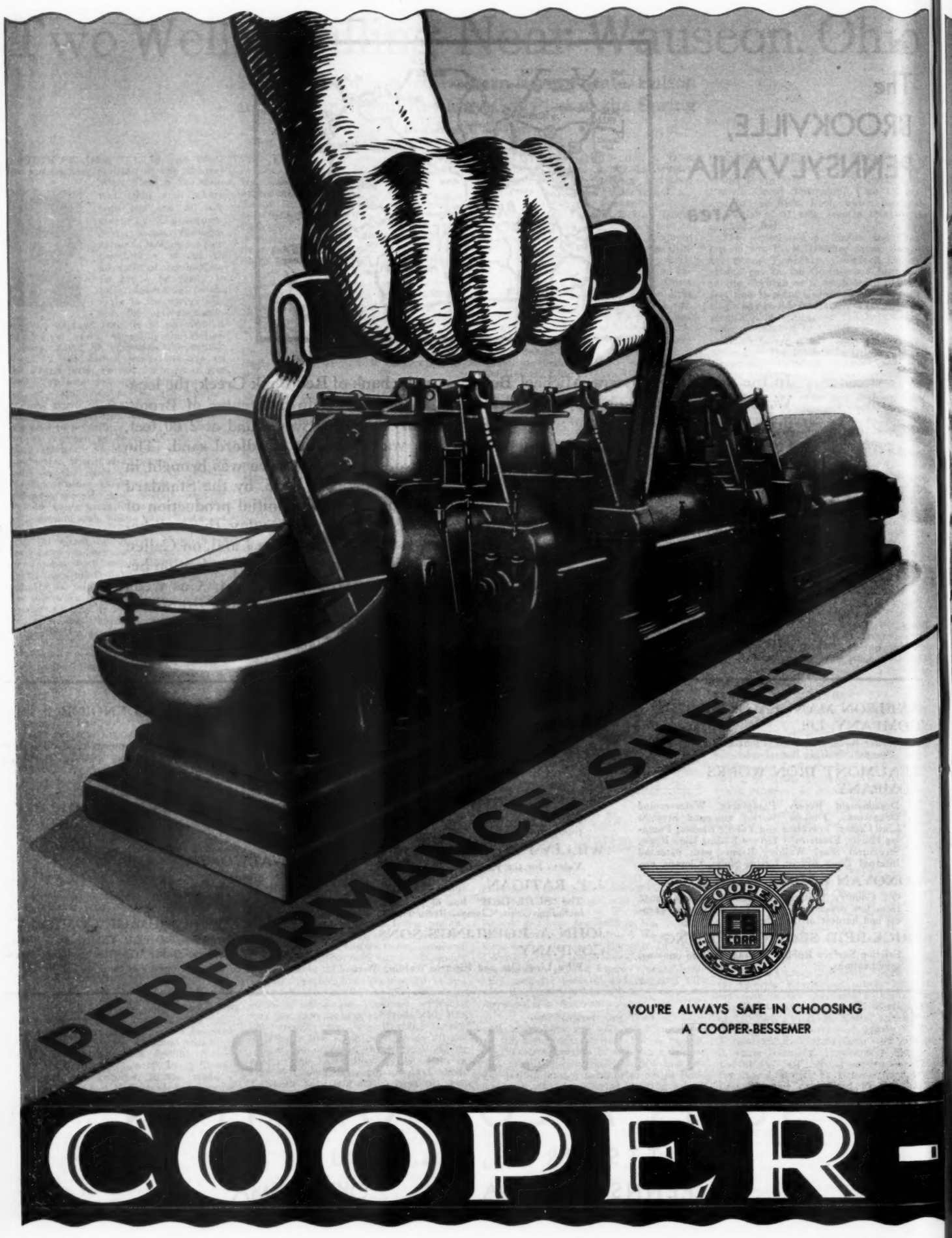
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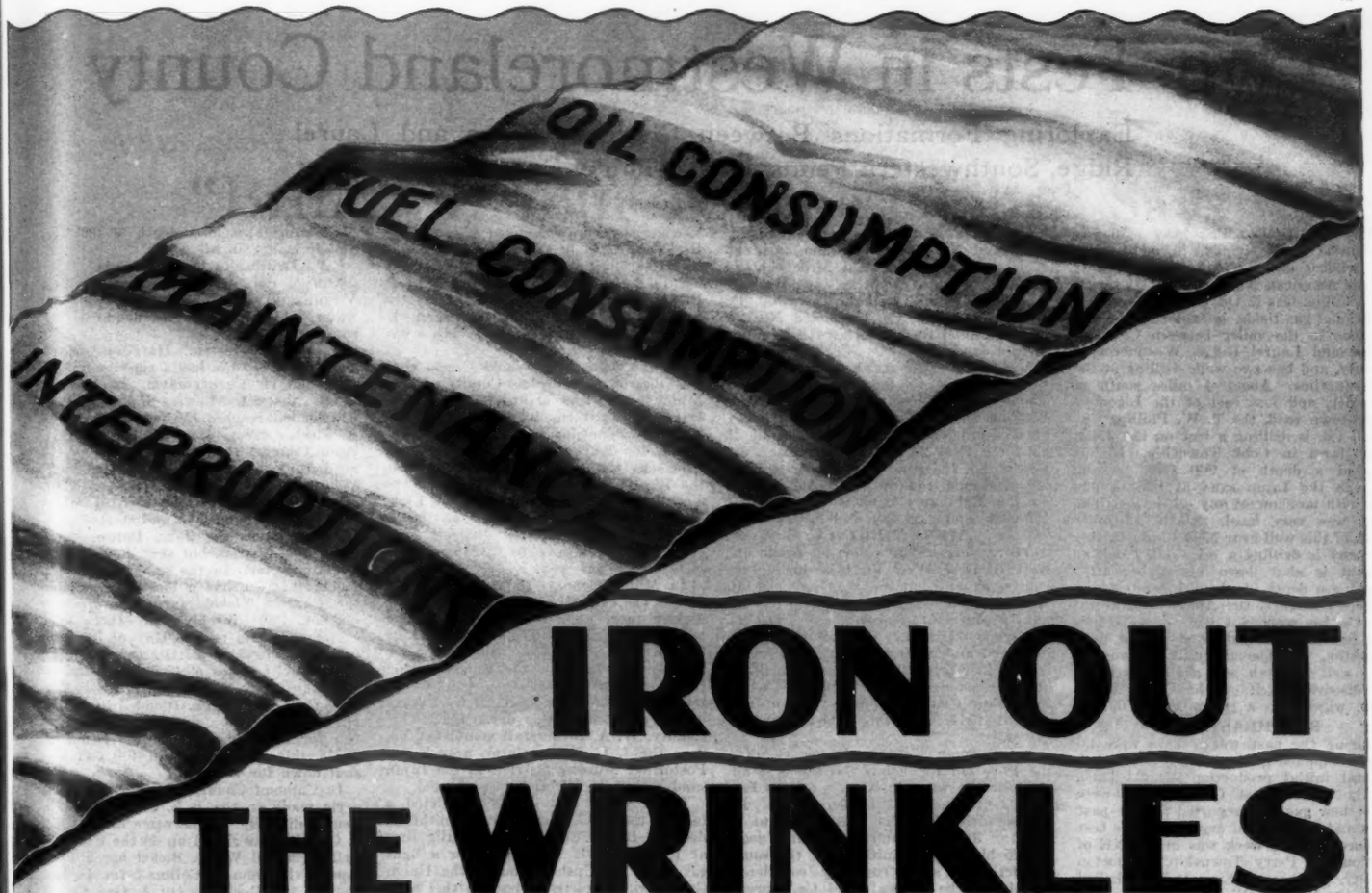

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BESSEMER

Two Tests in Westmoreland County

Exploring Formations Between Chestnut Ridge and Laurel Ridge, Southwestern Pennsylvania. Thirty Completions in East

By Staff Correspondent

PITTSBURGH, Pa., Oct. 13.—In southwest Pennsylvania, in addition to the wildcat drilling in Somerset County by the American Natural Gas Co., the T. W. Phillips Gas & Oil Co., in search for additional gas fields, is exploring the formations in the valley between Chestnut Ridge and Laurel Ridge, Westmoreland County, and has two wells drilling at the present time. About 4 miles south of Ligonier, and just east of the Ligonier-Stahlstown road, the T. W. Phillips Gas & Oil Co. is drilling a test on the J. H. Darr farm in Cook Township. It has reached a depth of 960 feet, passing through the Injun sand at 820 to 920 feet with no show of any oil or gas. The sand was very hard. About 12 miles north of this well near New Florence, this company is drilling a test well which at present is shut down for casing after reaching a depth of about 1,900 feet. In Somerset County, the American Natural Gas Co. has reached a depth of 3,300 feet in a test of the Royal Rhodes farm, near Ralphton, in Quemahoning Township. This well is north and slightly west of the discovery well on the O. S. Miller farm, which was a gasser at 2,550 feet.

SOUTHEAST OHIO

During the past week, there were 30 wells completed in the eastern fields with a total initial production of 393 bbls., mostly in southeast Ohio. There were fewer new gas well reported for the past week and an excess of dry holes. The best producer for the week was in the NE of Section 16, Perry Township, Coshocton County, southeast Ohio. It was drilled in by the Preston Oil Co. and was a test on the F. H. Donaker farm in the Clinton sand at a depth of 3,193 feet. After shot it made 180 bbls. the first day. In Section 30, Hardy Township, Holmes County, the East Ohio Gas Co. completed a No. 4 on the Harriett McCullough farm in the Clinton sand at 3,418 feet and it produced 15 bbls. natural the first day, which was increased to 90 bbls. the first 24 hours after shot.

In Ashland County, Robinson, Bode and others completed a test on the Phillip Doerrer farm, Section 16, Lake Township, in the Berea sand at 750 feet. It has a very light showing of oil and gas and it is doubtful if the well will be operated. In Athens County, R. W. Porter and others drilled their No. 3 on the Lick Run Coal & Clay Co.'s tract in the SE of Section 35, York Township, in the 30-foot sand at a depth of 3,200 feet. It made 5 bbls. the first day natural and after shot produced 18 bbls. the next 24 hours.

In Belmont County, Fulton and others completed a test on the Joseph Renker farm in the NW of Section 1, Somerset Township. It was drilled in the Keener sand, 1,440 feet and made 5 bbls. natural the first day, but after pumping a total of 50 bbls. the well was exhausted and pulled out. Another completion in Holmes County was the Ohio Fuel Gas Co.'s No. 2 on the Valentine Close farm, Section 13, Monroe Township. It was drilled in the Clinton sand to a total depth of 3,535 feet and was dry. The Preston Oil Co. had a like result in a test on the Margaret Robinson farm, Lot 19, Hopewell Township, Licking County, which was drilled in the Clinton sand.

In the shallow sands of Medina County, drilling is quite active, four completions being reported from there this week and of these two were very fair. In Lot 2, Section 13, Chatham Township, the Oko Oil & Gas Co. completed No. 43 on the Henry Essig farm in the Cow Run at 375 feet and after shot it produced 30 bbls. the first day. In Lot 1, Section 2 of the same township, the same company completed No. 33 on the Jesse McVicker farm at a depth of 465 feet and it made 25 bbls. the first 24 hours after shot. The same company completed No. 34 on the same farm at a depth of 447 feet and after shot it produced 5 bbls. the first day. In Lot 7, Section 13, of Chatham Township, E. R. Edson & Son Co. completed No. 27 on the Daniel Ross farm at 418 feet and it was dry.

Washington County had two completions. In Lot 41, Salem Township, the Thomas Oil Co. completed a test on the William Dewees farm in the Buell sand at a depth of 304 feet which made 2 bbls. the first 24 hours after shot. In Section 33, Independence Township, Herlan Schramm and others drilled No. 15 on the Ephram Cummons farm in the Mitchell sand, 325 feet and it was dry.

WEST VIRGINIA

There were but five new oil producers reported from West Virginia during the past week and but one was any size at all. In this section drilling is being mostly confined to proven gas areas as the crude oil market has not materially improved and a 20 per cent curtailment is still in effect. There is some drilling and one completion during the past week in Upshur County which is east of the general field, and this also proved a gasser.

In Sherman district, Boone County, the Pure Oil Co. completed the best oil well for the week in No. 38 on the Lafollette, Robson and Prichard tract B. It was drilled in the Berea sand at a depth of 3,285 feet and is estimated good for 25 bbls. a day initial. In the same district, the same company completed No. 46 on the Federal Coal Co.'s property in the Wier sand at 3,349 feet and it is showing for a good gas well. In Washington district of Boone County, the Hope Natural Gas Co. drilled in No. 7,498 and on the C. P. Barker farm in the Big Lime at 1,465 feet, showing for a fair gasser.

In Calhoun County, there was one oil and one gas well. In Lee district, C. B. Lewis and others completed a test on the Roy Goff farm in the Injun sand at 2,019 feet showing for a small gas well, natural. In Sherman district, L. P. Bickel completed No. 11 on the Martha Stump heirs farm in the Salt sand, 1,413 feet, estimated good for 5 bbls. a day natural.

On the waters of Arnold Creek, Central district, Doddridge County, Frank Finley and others drilled a test on the David Smith farm in the Injun sand, 2,170 feet, showing for a 1-bbl. pumper. In Louden district, Kanawha County, the Allegheny Gas Corp. completed No. 6 on the Bradford and Laidley farm and has a small gasser. The Manufacturers Light & Heat Co. drilled No. 2,077 on the T. D. Emery farm, Liberty district, Marshall County, deeper to 3,151 feet and it is also a gas well.

In Mingo County, the Two Way Oil & Gas Co. completed No. 2 on the C. C. Messer farm at a depth of 1,125 feet and in the Maxon sand and it is making 5 bbls. a day natural. This farm is in Harvey district. In the same district, the Southeastern Gas Co. completed a test on the Ellen Vance farm to a depth of 1,774 feet and it is dry. In Ritchie County, W. A. Bickerstaff completed No. 2 on the J. B. Rogers farm, near Fonso Postoffice, Murphy district, in the Injun sand and it is dry and was plugged.

I. L. Storts and others completed a test on the C. O. Boggs farm, Smithfield district, Roane County, in the Big lime at 1,888 feet. It is showing for a light gas well. In Upshur County the Union Gas Corp. completed a test on the Warren Burr farm, on Bull Run, Meade district, in the Gordon sand at 2,105 feet and has a small gas well. On the waters of Parish Fork, Clay district, Wirt County, W. C. Patterson completed No. 20 on the J. C. Hale farm in the First Cow Run sand and it is a 1-bbl. pumper natural. In Union district, Wood County, B. F. Webb & Co. drilled a test on the M. Swain farm to a depth of 925 feet and it is dry in all sands.

Drilling in West Virginia

Out of the 87 wells drilling in West Virginia, 27 are shut down for lack of water, which has hindered operations all summer.

In Ten Mile district, Harrison County, the Furner Oil Co. has a rig standing on the John H. Furner farm. In Hackers Creek district, Lewis County, Fred Flesher has reached 750 feet on the Mary S. Flesher farm. In Coal district, Harrison County, the Washington Gas Co. is drilling on the E. D. Fittro farm deeper and has reached 2,374 feet.

In Roane County, the Central States Gas Co. has spudded in and started drilling a test on the John Patton farm, Smithfield district, but shut down at 150 feet for water. In the same district the Union Gas Co. has a location ready on the Charles Nichols farm. In Spencer district, Paul Weekly and others have completed a rig on the Gay M. Sargent farm. In the same district the Mountain State Fuel Co. has cleared a location on the John T. Morfed farm. In Reedy district the Heck Oil Co. spudded in on the H. B. Price farm and shut down at 55 feet for water, and on the J. E. and J. G. Watkins No. 3 reached 400 feet and shut down for water.

In Calhoun County, Creek Barker has a rig ready on the J. L. Stump farm in Center district. In the same district, B. J. Crawley has rigged up on the Florence Pell farm and W. H. Bickel has a location on the John D. Collins farm. In Lee district the Rockdale Oil & Gas Co. is rigging up on the Thomas Slider farm and is rigging also on the C. C. Starcher farm. In the same district, Godfrey L. Cabot has reached the Injun sand on the S. E. Roberts farm and is testing the oil. In Lee district, K. C. Simmons is rigging up on the Dorothy J. Brannon farm. In Sherman district, L. P. Bickel has a rig standing on the Jack Bland farm. In Sherman district, the Virginian Gasoline & Oil Co.'s No. 4,260 on the Arminda Elliott is about due in the sand. In the same district, M. F. Crawley has reached 1,850 feet on the W. H. McDonald farm. In this district, A. Rothwell has a fishing job at 1,550 feet on the T. C. Cain farm.

In Gilmer County, James A. Tierney has shut down at 1,450 feet on the F. G. Hardman farm, DeKalb district, and is waiting on water. In the same district, A. E. Ellis and others are building a rig on the Bush heirs farm. F. G. Davis and others have shut down for water after reaching 550 feet on the Alva J. Hardman farm, Dekalb district. The Gainer Oil & Gas Co. has a rig standing for a second test on the Spencer Collins farm in this district, and the Bowser Oil Co. are building a rig for No. 2 on the John R. Ralston farm.

Clay County has become active again with the following new work. The Pure Oil Co. has reached 628 feet on the C. U. Summers farm, Henry district, and 1,121 feet in No. 3 on the A. J. Horan farm, and is grading a road for No. 4 on the same farm. On the B. F. Pierson farm, this company has part of the materials on hand. In Union district, Godfrey L. Cabot is down to 1,477 feet in a test on the Blue Creek Coal Land Co. tract.

In Marshall district, the Cameron Light & Heat Co. has reached 3,550 feet on the W. A. Dowler farm in Liberty district. In the same district, the Twin Oak Oil & Gas Co. is down to 3,040 feet on the W. E. Parriott farm. In Cameron district, Fry & McCracken are drilling No. 3 on the John McGinnis farm and in Webster district are rigging up on the Harvey Knight farm.

In Wetzel County the Burton Develop-

(Continued on Page 114)

TENNESSEE OPERATORS ENCOURAGED BY BIG WELL OVER KENTUCKY LINE

By George A. Whitney

SPARTA, Tenn., Oct. 13.—The bringing in of a big well at 600 feet on the McKinney farm, northeast of Glasgow, near Horse Cave, in Hart County, Kentucky, and about 30 miles from the Tennessee line and on the west end of a large gas field serves to emphasize the fact that the northern tier of counties along the Kentucky-Tennessee line lies directly in the trend of development and now will undoubtedly share in the intensive drilling campaign which the new strike has set in motion. A geologist recently laid a rule on Green County, Kentucky, and on Dickson County, Tennessee, and said that anywhere east of that line would be a likely place to expect gas and oil and that he knew no geological reason why commercial production might not be found in that entire area because it lay on western slope of the great Cincinnati Arch and it seems the finding of the big well a week or so ago is only another proof of the correctness of his prediction.

Further check on the production thus far obtained in deep wells discloses that the well drilled by New York parties on the Short farm in Stillhouse Hollow in Cumberland County, 9 miles north of Celina, got its pay at about 1,385 feet in the St. Peter sandstone. This well was drilled some time during 1925 and never shot. It pumped about 5 bbls. daily for some three or four years; it is not far from the big St. Peter sand well drilled about the same time by the late W. S. Raydure, of Bowling Green, Ohio.

One of the St. Peter sand wells on Lock Branch in Jackson County is being put in shape to pump, having stood full of water and oil for past two years. When this well is pumped regularly it will be the "missing link" between probability and reality, as it will be the first producing well in successful operation and go far towards proving the assertion of the geologist who recently announced the similarity of the St. Peter sand in Tennessee to the Wilcox sand of Oklahoma. Recent geological work in the vicinity of the Long Branch deep wells shows them to be on a good structure of large area and surrounded with smaller structures on the same general anticline.

Taking Up Acreage

A number of active operators have visited the State during the past week, among them being J. L. Clark, a producer and contractor of Charleston, W. Va., who is understood to be taking on some acreage with a view of shipping in one or more strings of tools. R. D. Baker, of the Inter-State Oil Co., of Owensboro, has leased a large block north of Carthage and will drill several tests this fall. The territory in that section is deeply cut by streams; the black shale outcrop on the hills and structural con-

(Continued on Page 114)

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O. C. S. Universal Rig Front, completely Timken Bearing Equipped.

The oil fields tolerate no weaknesses—heed no alibis. Oil operators must have machinery that will do more than its bit—and keep on doing it... without fear or favor. They have neither time nor money to waste on equipment that requires excessive maintenance attention.

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The Oil Country Specialties Mfg. Co., Coffeyville, Kansas, provide Timken anti-friction protection and economy on practically all of the equipment they build, including their Universal Rig Front, Chain Driven Sand Reels and Self-Aligning Jackpost Boxes.

They know that the wide diversity of loads and stresses encountered in these different types of equipment demands more than anti-friction efficiency in the bearings.

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Natural Gas Industry Developments

MICHIGAN PRODUCTION ABOUT 3,250,000 FEET

MUSKEGON, Mich., Oct 11.—Natural gas production is averaging about 3,250,000 feet a day with the first 700,000 feet being consumed by the customers of the Muskegon Gas Co. and the rest being used for industrial purposes. The West Michigan Consumers Co. has the greatest available daily supply, about 2,750,000 feet. Although not all of this is being run every day a greater share of it is produced.

The West Michigan Consumers Co. and the Muskegon Gas Co. have worked out a plan to save the field as much as possible. Under this co-operative plan the Muskegon Gas Co.'s storage tanks are filled during the night when its send-out is lowest so that the heavy pull of industrial consumers of the other company can be met more easily during the daylight hours. Indications are that this plan will help insure natural gas for a greater period for consumers of both companies as it equalizes the pull on the wells, making for steadier operation and greater recovery of gas as well as oil.

Several clean-out rigs are kept constantly busy throughout the field pulling rods and tubing and bailing out water from the producing wells. It is said by some operators that oil as well as gas production might be considerably increased if the wells were cleaned out oftener and better operating practices followed.

FRANCHISE IN BUTTE FOR MONTANA POWER

CASPER, Wyo., Oct. 13.—The Montana Power Co. has applied to the city council of Butte, Mont., for a franchise to serve the city with natural gas, to be voted upon October 28 by the council. The company's representative stated that the firm was ready to spend $1,500,000 as soon as the franchise was granted, Also the company contemplates spending $15,000,000 on a pipe line to bring the gas to Butte. No statement was made as to where the gas is to be obtained, but it is presumed that Wyoming gas fields in the northern part of the Big Horn Basin would furnish it. The vice president of the Montana Power Co. stated that other cities in central Montana are included in the plan to furnish natural gas and an application for a franchise was made to the council of Anaconda shortly after the application was filed at Butte.

NATURAL GAS IN DEL RIO

Del Rio, Tex., is enjoying gas service for the first time as a result of the turning of natural gas into its recently completed domestic distribution system, according to announcement made by Texas Gas Utilities Co., subsidiary of Appalachian Gas Corp. Gas is brought from the Rycade Field, 52 miles, through a 10¾-inch high-pressure line completed in July. One of the sources of gas supply is the noted No. 3 Chittim, having a rock pressure of 2,100 pounds. This well has an estimated open flow of approximately 11,000,000 feet daily.

UTAH COUNTY FRANCHISE

SALT LAKE CITY, Utah, Oct. 13.—After more than a year of controversy, Wasatch Gas Co., subsidiary of Ohio Oil Co. and a purveyor of natural gas from Wyoming fields to consumers in Utah outside of Salt Lake and Ogden, has been granted a 50-year franchise by the commissioners of Utah County. The company will extend its mains into the county from Sandy, 15 miles south of this city.

NEED FOR PLANNING ADVERTISING IN THE PROMOTION OF GAS SALES

By F. F. Schauer
Vice President and General Manager, Equitable Gas Co., Pittsburgh, Pa.*

If we intend to make our gas business grow and prosper during the next decade as it has in the past, it is vitally necessary that much attention be given to the ways and means by which we increase our gas load. It is in the commercial end of the business, the same as it is in the commercial end of the automobile business and other modern industries, that most attention is needed today. In the early days we were kept busy supplying our customers with gas. We were concerned chiefly with the technical difficulties of the industry, but today our engineers are well conversant with these technical aspects. It is the commercial man who is in the limelight and who requires every ounce of energy, assistance and whole-hearted co-operation that the operating man and the rest of the company can give him.

Especially in the past year or so, the gas industry has made rapid strides in its methods of selling its products. However, we still have far to go to reach perfection, or even reach the high plane of the commercial departments of such modern merchandisers as the automobile industry, the cigaret manufacturers, the toothpaste promoters and others with which you are familiar.

I feel that no small part of the good work that has been done in the past few years in increasing our selling power has been due to the scientific selling principles which we have followed.

In contrast to past practice the commercial man in most utilities today is spending just as much time and energy in planning and budgeting his sales promotional and advertising program as the engineer is devoting to his technical problems. They are both more or less following the same fundamental rules, the most important of which is embodied in that slogan used by one of the largest electrical manufacturers in the country, "Plan your work and work your plan."

Proper Planning

Nothing is more essential in developing a good selling program than the proper planning and budgeting of the whole selling program. Many utilities have only very recently learned that it is not sufficient to say that a half of 1 per cent of the gross revenue, or any such arbitrary percentage figure, would be used in estimating the advertising and sales promotional expenditures for the year. Of course, some of these spasmodic campaigns and selling activities were successful but for the most part they did not give an adequate return on the money expended for the chief reason that they were not planned and then executed according to the plan.

It was no wonder that the advertising that accompanied such spasmodic efforts was often blamed for the campaign's failure. Now let me call your attention to the methods of a company that has realized this and is making rapid progress in planning and budgeting its advertising program.

Example Cited

To show how one company has to a great degree remedied this situation and is now a most hearty advocate of the well-planned and well-budgeted advertising program, I am going to refer to their sales promotional department's plans for 1930. I have here a very elaborate and excellent table which they have prepared covering the entire selling activities for the current year. On it appears the schedule of campaigns, month by month. It shows why they believe that a certain number of given devices can be sold, based on past statistics, both in number of units to be sold and in merchandise revenue.

It also gives the estimated added annual revenue from gas used by the device, and the total estimated cost of the campaign. It gives in detail the amount of money estimated to be spent for the various forms of advertising.

Let us take an example. In September house heating is to be campaigned. The table immediately shows us the following facts:

It is planned to have a house heating campaign in September. Records of the previous year's sales show 454 furnaces sold throughout the entire year. Based on $200 annual revenue each, these furnaces gave a total estimated annual revenue of $90,800. For the month of Sep-

(Continued on Page 167)

*Before American Gas Association, Atlantic City, N. J., October, 1930.

POLISH GAS ENGINEERS IN ANNUAL MEETING

At the twelfth annual meeting of the Polish Gas and Water Works Engineers, held at Drohobycz under the chairmanship of Czeslaw Swierczewski, who was celebrating his 40 years' work in the gas service, the discussions centered mainly on the problem of supplying gas and water on long distances. For the first time there was discussed the problem of distribution of coke gas from Upper Silesia in the direction of Czestochowa, Cracow and Tarnow, Bielsk, Cieszyn and Lubliniec, according to the project of Engineer Konopka and Director Engineer Szulc.

An interesting paper on coke was delivered by Director Klimczak of Bydgoszcz. Director Seifert of Cracow spoke of the heating balance, Professor Witkiewicz, Proffessor Jamroz, Engineer Klewski, Engineer Tomasik, Director Zardecki, Director Piwonski, and many others spoke of the earth gas. There was discussed also normal normalization of burning gas by Engineer Krzyzkiewicz; gasoline works by Engineer Psarski; the origin of coal by Director Wandycz and the gasification of brown coal by Professor Deryng.

Papers on gas and water mains were delivered by Director Buzek of Wegierska-Gorka's Foundry, by Doctor Szulce about C. I. pipes, and Engineer Piekarski on concrete pipes. Participants in the meeting took part in the professional excursions to Boryslaw, where oil wells were inspected, as well as to Daszawa, from where, in 1928, gas has been conducted to Lwow situated 70 kilometers off that place. Several decisions were taken at the meeting, the most important concerned working out of a detailed project of gasification of Poland by means of building central gas stations and this distribution of earth and coke gas.

ELWOOD GAS CONTRACT

LOS ANGELES, Calif., Oct. 13.—Contract has been signed by Rio Grande Oil Co. and Barnsdall Corp., jointly operating Elwood Field properties for delivery to Southern Counties Gas Co. of a minimum of approximately 38,402,000,000 feet of dry natural gas over a 10-year period. Contract calls for a minimum of 2,590,000,000 feet in the first year, starting November 14, 1930; 3,178,000,000 in the second year; 3,178,000,000 in the third and throughout the remaining years of the contract.

GAS MAN GIVEN MEDAL FOR SAVING SIX LIVES

For saving the lives of six men who had been overcome by gas, Jesse Adams Harvey, of Auburn, N. Y., a tinsmith, employed by the Empire Gas & Electric Co., was awarded the American Gas Association Meritorious Service Medal at the twelfth annual convention of that association at Atlantic City, N. J., October 15. The presentation was made by B. J. Mullaney, retiring president of the association. Each year this award, which was made possible by Walter R. Addicks, senior vice president of the Consolidated Gas Co. of New York, N. Y., is conferred upon the individual who is adjudged to have performed the most meritorious act in the gas industry in a 12-month period.

It was on April 16, 1929, that Mr. Harvey rescued a foreman and five laborers, who had been assigned the task of cleaning and repairing a gate valve in a 12-inch gas main. This valve was located in a cellar. During their attempt to repair the valve, the removal of bolts caused the gas pressure to blow a blinding shower of rust particles in their faces. Temporarily blinded, the men quickly were overcome by the escaping gas when Mr. Harvey, who was engaged in another task, stumbled upon them. Acting quickly, he extinguished a nearby open flame test light and unmindful of the danger which was growing greater each moment, he started into the cellar and had dragged out four of the men before he became partially asphyxiated but managed to reach a telephone and called for help before collapsing.

His heroic act resulted in the saving of the lives of all the imperiled men.

NEW RATES APPROVED FOR 23 KANSAS TOWNS

TOPEKA, Kans., Oct. 13.—The Public Service Commission has approved new schedules of domestic gas rates filed by the Union Public Service Co. for 23 towns, mostly in central Kansas.

The following schedule was approved for Barnard, Beloit, Cawker City, Downs, Esbon, Formoso, Geneseo, Glen Elder, Jewel, Kanopolis, Lebanon, Lincoln Center, Lucas, Luray, Mankato, Minneapolis, Montrose, Osborne, Smith Center, Sylvan Grove and Vesper:

First 1,000 feet or less a month, $1.50; for the next 2,000 feet, 10 cents a hundred, and 5 cents a hundred for the remainder of monthly delivery, with $1.50 minimum monthly bill and a 10 per cent penalty for bills not paid within 10 days after rendition.

Ellsworth was given the same schedule, except that the rate was reduced to 40 cents a thousand for monthly delivery in excess of 18,000 feet.

For Whiting a schedule of 20 cents a hundred for the first 500 feet monthly, 12 cents a hundred for the next 2,500 and 5 cents for the balance of monthly delivery, with a $1 minimum and a 5 per cent penalty, was established.

SILK MADE FROM NATURAL GAS

The manufacture of artificial or cellulose silk from natural gas is made possible as the result of a discovery recently reported by Prof. Harold Hibbert of McGill University. Carbon dioxide and water are the basic materials used in the new process. Carbon dioxide is a by-product of the combustion of natural gas. The making of sugar from carbon dioxide and water was discovered in England some time ago. Professor Hibbert has gone a step further and converted the sugar into cellulose, paralleling the steps taken by nature in the growing plant and tree.

MORE THAN 80% OF ALL THE GAS MANUFACTURED IN THE UNITED STATES IN 1929 COULD BE MEASURED BY

EMCO

Positive Displacement Gas Meters Built In That Year.

EMCO, the largest and most complete line of Meters and Regulators.

* PITTSBURGH EQUITABLE METER COMPANY

Main Office and Works—Pittsburgh, Pa.

New York City	Tulsa, Okla.	Columbia, S. C.	Seattle, Wash.	Kansas City, Mo.
Chicago, Ill.	Dallas, Texas	Salt Lake City	Houston, Texas	Los Angeles, Calif.

* An original George Westinghouse Enterprise

Personal Paragraphs About Oil Men

Melvin Thompson, who has been drilling in the Trinidad fields, is spending three months' furlough at Petrolia, Ontario.

* * *

G. H. O'Donnell, representative of the Moody-Seagraves interests in the Rocky Mountain region, is in Boise, Idaho, on business.

* * *

Mr. and Mrs. David Matheson and children have returned to Petrolia, Ontario, from Colombia. Mr. Matheson, who has been seriously ill, is on sick leave.

* * *

Frank H. Sheffield, president of the Sheffield Oil Company, with offices at Beaumont, Tex., has established operating offices at Houston in the Neils Esperson Building.

* * *

Donald M. Davis has been made chief geologist of the Gulf Coast district of the Pure Oil Company with offices at Houston, Tex. He succeeds George M. Bevier, who recently resigned to do consulting work.

* * *

A. J. Hardendorf, former Wyoming oil operator, has moved his headquarters from Dodge City, Kans., to Denver, Colo. He is at present engaged in promoting a natural gas enterprise for eastern Wyoming and western Nebraska.

* * *

L. A. Wainwright of the Amerada Corporation at San Antonio, Tex., with Mrs. Wainwright, has been on a vacation trip to Kerrville. Mr. and Mrs. Louis McNaughton of the same company spent their vacation also at Kerrville.

* * *

N. H. Darton of the United States Geological Survey, Washington, D. C., has been spending some time in Houston, Tex., gathering final data for the compilation of a new geological map of Texas. While in Houston he was given a banquet by the Houston Geological Society.

* * *

Henry N. Dawes, president of the Pure Oil Company, and W. T. Holliday, president of the Standard Oil Company of Ohio, have been visiting in Texas, and looking over the Van Field, Van Zandt County, East Central Texas, where the Pure Oil Company has large holdings and producing properties.

* * *

George S. Harrison, director of Home Oil Company, Ltd., has returned to Vancouver, British Columbia, from a 10 months' world tour. Mr. Harrison, who was accompanied by his wife and family, traveled in 18 different ships, covered 20,000 miles by motor, and traveled in 57 trains.

* * *

Craig A. McLaughlin of the Union Oil Company's sales department, an experienced aviator, will leave Los Angeles for Guatamala November 1 where he will become general superintendent of the new air mail service being established by Roderick Burnham, who up until recently was in charge of the Union Oil Company's land department.

* * *

H. L. Edwards, general superintendent of the northern division of the Humble Oil & Refining Company, having offices at Houston, Tex., has resigned to become associated with J. E. Mabee, drilling contractor. Mr. Edwards is being succeeded at Houston by David Frame, who has been division superintendent at McCamey.

* * *

E. C. McCarnes, production superintendent for the Transcontinental Oil Company in San Angelo, Tex., has returned from Rumania, where he inspected oil properties owned jointly by the Transcontinental Oil Company and Rumania-Americana, subsidiary of the Standard of New Jersey in that country. On Mr. McCarnes' return home he passed through Austria, Hungary, Germany, Belgium, and England. W. E. Wrather, geologist of Dallas, Tex., who accompanied Mr. McCarnes to Rumania, stopped in Switzerland before continuing home. His family is with him.

Reg. McDermid is in Sarnia, Ontario, on furlough from Peru, where he has been with the International Petroleum Company.

* * *

W. H. Strang, supervisor of the mineral leasing division of the United States Geological Survey with Casper, Wyo., headquarters was in Tulsa the past week.

* * *

A. C. Rubel, assistant manager of production for the Union Oil Company, has been in Tulsa but is expected to return to the Los Angeles office around the middle of October.

* * *

W. B. McCormick, who, with the late S. S. Hunter of Shreveport, La., opened the Monroe gas field in 1915, is critically ill in a Shreveport hospital following an operation.

* * *

H. D. Flautt, superintendent of the Producers & Refiners gas plant at Casper, Wyo., and E. C. Wagner, superintendent of the company's pipe line department, were visitors to Tulsa last week.

* * *

G. H. Jaques, a director and the general superintendent of Midwest Refining Company, has returned to Casper, Wyo., from a business trip to company properties in Kansas and company offices in Denver, Colo.

* * *

Art Olson of the Olson Drilling Company, R. B. Roark and Ralph Reiser of the Shell Petroleum Corporation returned to Tulsa in Mr. Olson's airplane following a big game hunt in the Jackson Hole country. Each got an elk and Mr. Olson a moose, also.

Men of the Industry

Richard H. Morrison

Richard H. Morrison has succeeded Warner Clark as manager of the California Company, southern district, with headquarters in Dallas, Tex. Mr. Morrison graduated from the University of California Law School in 1921, and practiced law with Pillsbury, Madison & Sutro, general attorneys for the Standard Oil Company of California in San Francisco from 1921 to 1923.

On January 1, 1923, Mr. Morrison went to work for the Standard Oil Company of California in the land and lease division in San Francisco. For the past five years he has been superintendent of the land and lease division of the Standard Oil Company of California in Los Angeles.

Harry Mills Astin of Casper, Wyo., is returning home after having completed his contract with the Pan American Petroleum & Transport Company on the Island of Aruba.

* * *

F. G. Rappaport of United Controlled Oil Fields, who has been spending his vacation in England, has returned to Maracaibo, Venezuela, field headquarters of his company.

* * *

S. C. Stathers, Standard Oil Company, was elected president; George Snyder, The Texas Company, vice president, and C. L. Moody, secretary-treasurer, of the Shreveport, La., Geological Society at the annual meeting.

* * *

Gus Morrow and P. B. Dykeman of Riverton, Wyo., were in Casper, Wyo., on business for the Standard Carbon Company which is developing gas for a carbon black plant in the Buffalo Basin Field, about 40 miles southeast of Lander.

* * *

Mr. and Mrs. G. D. Brown and two children, who have spent three months in Petrolia, Ontario, and vicinity, sailed from New York recently for Negritos, Peru, where Mr. Brown has taken another three-year contract with the International Petroleum Company.

* * *

Maj. Robert Muldrow of the Southwest Elevation Company with offices in San Antonio, Tex., has taken up his residence in San Antonio, and Robert Barling of the same company, who has been in charge of the San Antonio office, is being transferred to Laredo. Major Muldrow was formerly with the United States Geological Survey.

* * *

J. S. Ivy, head of the geological department of the Louisiana Gas & Fuel Company and associated companies at Shreveport, La., for several years, has been sent to Rumania by United Gas Company, with which the Louisiana was merged in the recent Moody-Seagraves-Electric Bond & Share consolidation of a number of Texas and Louisiana gas-producing and pipe line properties.

* * *

D. W. Harris, vice president and general manager of the Arkansas Natural Gas Company at Shreveport, La., has returned to his desk from a three weeks' stay in New York in connection with the Cities Service Company's purchase of controlling interest in the Louisiana Oil Refining Corporation. M. J. Grogan, presdent of the latter, who was in New York on the same mission, has also returned to Shreveport.

* * *

John M. Lovejoy, recently elected president of the Mexican Seaboard Oil Company, which has extensive holdings in the Kettleman Hills Field of Fresno and Kings Counties, is expected in Los Angeles early in October. Mr. Lovejoy, who spent July and August in California, is president of the Petroleum Bond & Share Corporation of New York and was formerly vice president of Amerada Corporation.

* * *

Com. F. T. Chambers has been appointed director of the United States naval oil shale and petroleum reserves. Commander Chambers has been in charge of the third naval district with headquarters in New York City. He succeeds the late Admiral Rousseau. The inspector of oil shale and petroleum naval reserves for Colorado, Utah and Wyoming is Com. A. A. Baker, with headquarters in Casper, Wyo.

* * *

J. R. Reeve, who has been United States Geological Survey engineer in charge at Billings, Mont., has been transferred to Casper, Wyo., as deputy supervisor. W. H. Strang is the other deputy at Casper. C. R. Hauptman, who has been petroleum engineer in Casper offices, has been placed in charge of the offices at Midwest, Wyo. J. E. Wall, who has been in charge of the Midwest offices, has been transferred to Montana.

It's field performance that counts!

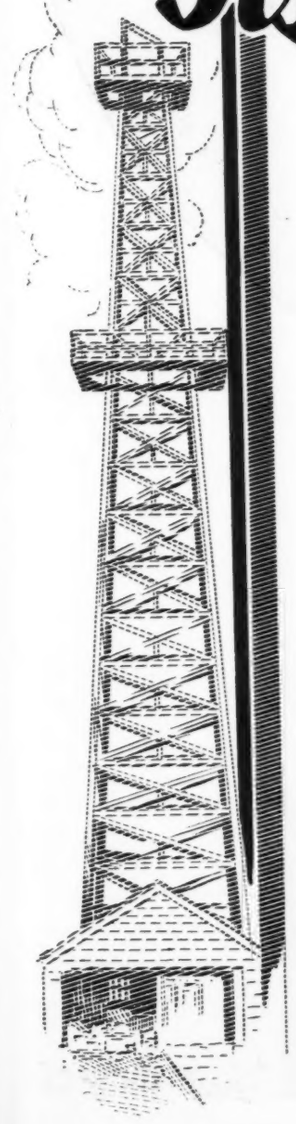
The ability to carry a heavy load, operate on a non-stop basis, and operate at minimum expense, are three essential requirements of gas engines and compressor units.

Equipment that delivers less not only fails utterly, but becomes the direct cause of the staggering losses that invariably come hand in hand with "down" periods.

Follow the thought further and one must admit that equipment that fails is bound to prove the most expensive in the long run—even though lowest in price at time of purchase.

Therefore, the only sound course to pursue is to INVESTIGATE—get clear away from initial cost and base your selection on *field performance*. In no other way can you make certain of capacity and non-stop performance at reasonable operating costs.

To assist on any comparative investigations you may contemplate, data on Watts-Miller equipment, with list of users, will be mailed upon request.



THE MILLER IMPROVED GAS ENGINE CO.

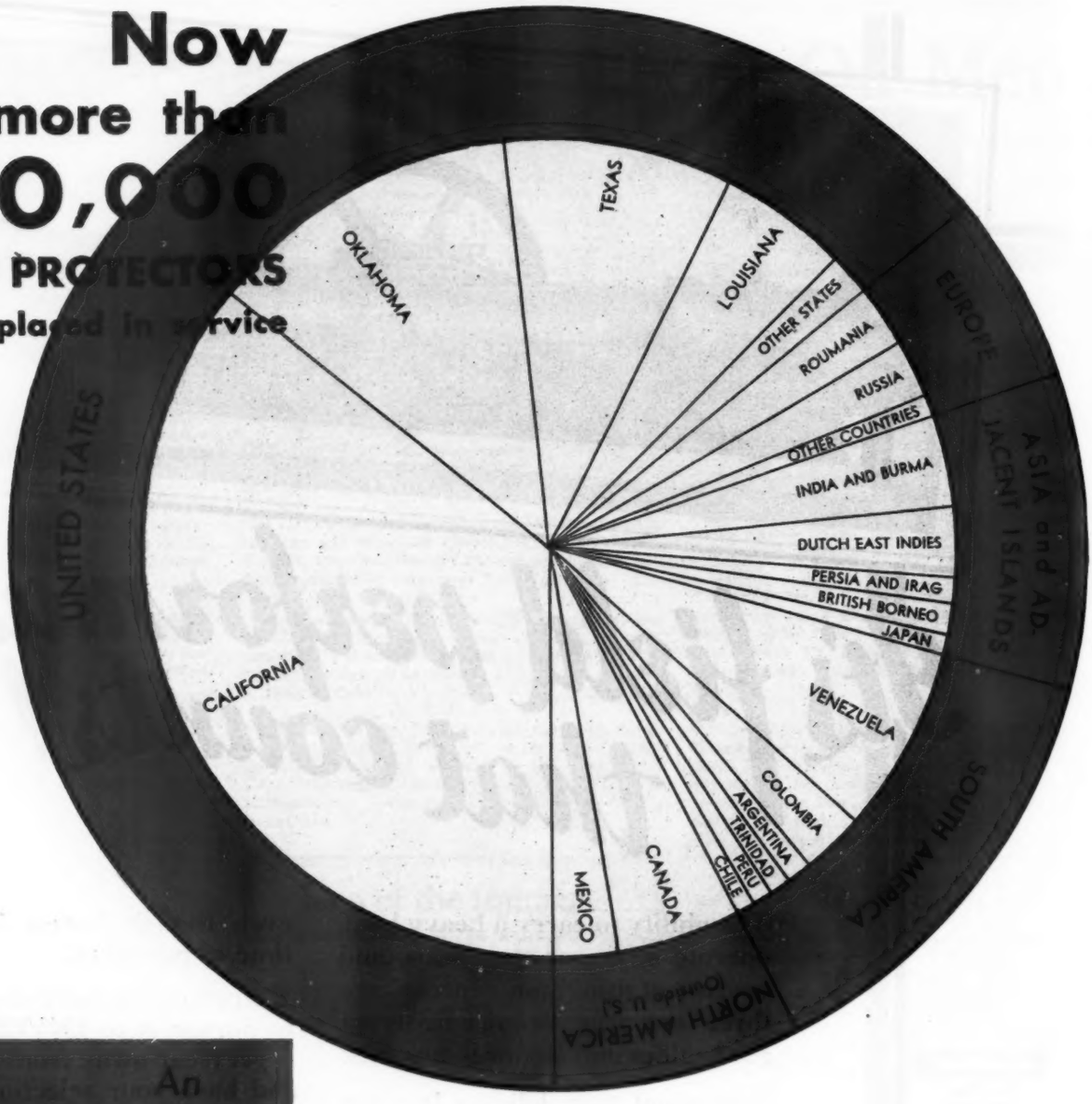
Tulsa, Okla., Office
323 No. Cheyenne Ave.

SPRINGFIELD, OHIO

Los Angeles Office
4441 Santa Fe Avenue

WATTS GAS ENGINES AND COMPRESSORS **MILLER**

Now more than 310,000 BETTIS PROTECTORS placed in service



An international necessity in every rotary field

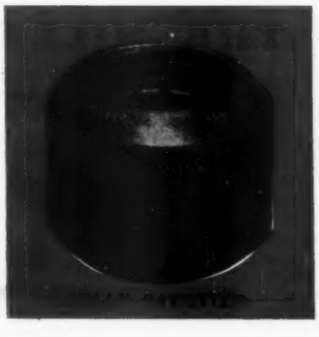
The chart shows the proportional demand for Bettis Protectors in the various rotary fields throughout the World—proof of the international standardization accorded the most essential drilling specialty.

PATTERSON-BALLAGH CORP.
INSURANCE EXCHANGE BUILDING
LOS ANGELES

Texas and Gulf Coast Distributors:
Bettis Sales Co., 917 Merchants & Mfrs. Bldg., Houston

Oklahoma Distributors:
Bailey & Becker Company, 410 Thompson Bldg., Tulsa
New York Office: 39 Cortlandt St.

Carried in stock at Los Angeles, Ventura, Kettleman Hills, Bakersfield, Coalinga and Long Beach, California. Tulsa and Oklahoma City, Okla. Houston, Texas. Hobbs, N. M. Calgary, Alberta, Canada. New York City.

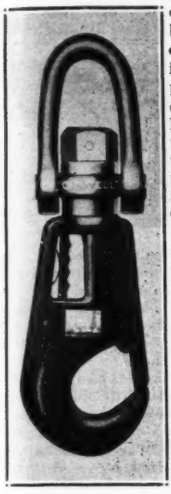


"Best bet yet"

Oil Field Equipment and Supplies

SAFETY HOOK IS OPENED BY HAND PRESSURE ONLY

"Oilwell" safety sucker rod and tubing hooks are built with a patented automatic locking device and can be opened only by hand pressure on the latch operating lever. When pressure is applied on this lever the latch is raised into the body, clear of the loop. This feature provides maximum clearance for easy "stabbing" and eliminates the possibility of the latch catching on the elevator bail.



The grip, or D-handle, located on the back of the hook, affords ease of operation and protects the operator's hand from injury. There are no projections to catch on the derrick girts or braces.

"Oilwell" safety hooks are made from carbo-manganese steel and are scientifically heat treated. They are light but rugged and well balanced. These hooks are equipped with Timken tapered roller bearings which permit them to swivel perfectly under heavy loads. Maximum speed with safety in handling sucker rods and tubing is gained. The hooks are made in two sizes for sucker rods and two sizes for tubing.

DEVICES DESIGNED FOR PIPE LINE OPERATIONS

Pipe bending shields, torch outfits and pipe trowels are among devices for pipe line work made by the American Steel Works, Kansas City, Mo.

Pipe bending shields are made from heavy sheet steel lined with asbestos fiber board, complete with chain and load binders. They can be fired at each end or front, direct against the pipe. The shield can be clamped beside a pipe or on top of the pipe wherever heat is needed.

American double torch outfits with pipe shield will generate a heat temperature of 2,140° F. from actual tests. The double bending torch outfits came complete with vertical tank, two lengths of canvas, braided metal lined hose, and two coilless type torches.

American Coilless torches are built especially for hard usage. For use in thawing pipe; heating and bending pipe; drying out crevices, track frogs and switches; softening old asphalt and pavement. Also used in numerous other places where intense heat is needed. Complete with 6-foot length of braided hose.

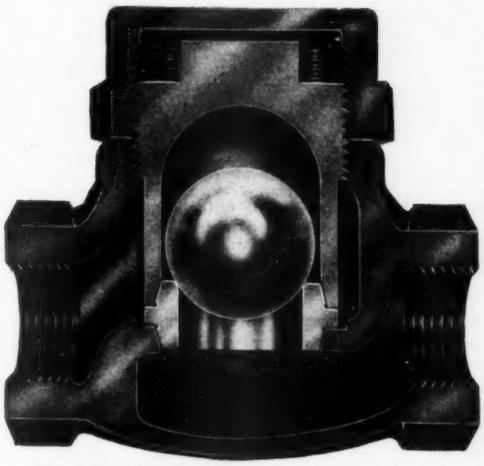
The American pipe trowel is used in spreading hot coatings when rolling rigs are used. The canvas can be renewed, making virtually an indestructible piece of equipment.

ACQUIRES GILMAN COMPANY

The Worthington Pump & Machinery Corp., New York, has acquired the Gilman Manufacturing Co., East Boston, Mass. Primarily Worthington is expanding its line of pneumatic service to mines, quarries, contractors and industry, manufacturing under one head the Gilman line of rock drilling equipment which supplements the line of Worthington Feather Valve air compressors.

CHECK VALVE IS SAID TO REDUCE SHUTDOWN LOSSES

A check valve that can be installed on any line, handling any fluid, and which is said to insure that once properly installed there will be no costly shutdown occasioned by the necessity to remove and replace the valve because of leakage from a worn seat, is now manufactured and marketed by the Oil Field Engineering Corp. of Fort Worth, Tex.



This valve, the Bal-Re-Nu, has been patented by C. S. Jones and Leidecker of Tulsa, who have licensed the Oil Field Engineering Corp. as sole manufacturer and distributor for the new product.

The construction of the valve is an adaptation of the familiar ball and seat to a valve installation. Whenever the ball or seat becomes worn, it is a simple matter to unscrew the top and cage, remove the worn parts and substitute new ones.

The necessity for replacement of balls and seats has been further reduced by the use of the Petroleum Equipment Co.'s Nu-Alloy, Nu-Bronze or Nu-Steel balls and seats in the valves.

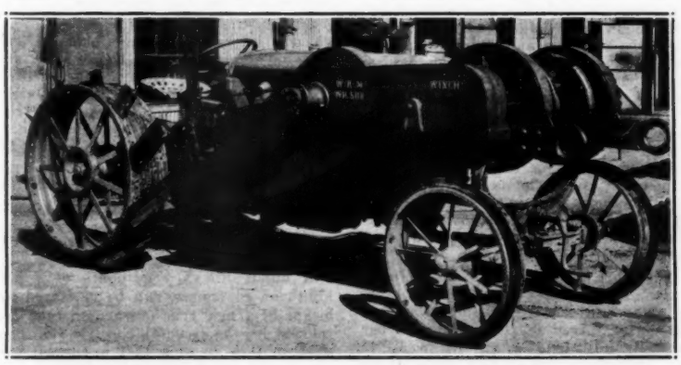
ATTACHMENTS FOR BLOWPIPE

The Oxweld Acetylene Co., New York, has introduced accessories for the Type W-17 welding blowpipe. The Type CW-17 cutting attachment enables the blowpipe to do a reasonably wide range of cutting work. A long handle is used for operating the cutting oxygen valve. When this handle is not in use, it can be pulled forward parallel to the tubes so that the whole attachment may be carried around in the operator's pocket. The W-17 to W-15 adaptor makes it possible to use any of the welding heads available for the Oxweld W-15 sheet metal welding blowpipe with the Type W-17 welding blowpipe handle. This means that the W-17 welding blowpipe may be used on work ranging from the lightest type of welding to the heavy general welding work required of such equipment.

REGISTER IS OF NEW DESIGN

A new type of register for use with gas or oil burners in refinery work has been designed by the Coen Co., Los Angeles, Calif., manufacturer of mechanical oil burners, duplex strainers and other refinery equipment. The new register provides complete frontal insulation as well as greater capacity, with less air pressure. Used in conjunction with the Coen burner the register is designed to give a rotary motion to the air used for combustion without the use of air-directing vanes. A new type outer torch door permits observation of the flame without the dangerous heat or flare-back sometimes experienced by the operator. The register is designed to be used with either a gas ring or with a straight oil fire, depending upon the individual preference.

W-K-M HAS OIL-FIELD WINCH FOR UNITED TRACTORS



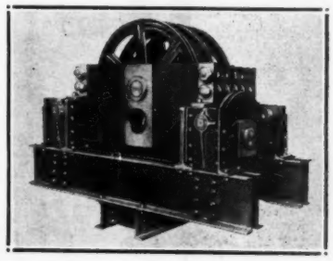
W-K-M Co., Inc., of Houston, Tex., manufacturer of oil field, pipe line and industrial equipment, announce the production of a new front-mounted winch for Allis-Chalmers Model "U" (United) tractors.

Primarily designed for rod and tubing pulling in the oil fields, the utility of the winch, however, is not confined alone to this work. It can be used for moving machinery, unloading pipe, clearing land, pulling stumps, skidding derricks, towing logs and many other operations. Rated pull on a single line is 12,000 pounds, although a substantial reserve of power is left after this rated maximum is reached.

Structurally, the machine is of heavy, strong framework, 6-inch channel steel sides being used. A large diameter drum provides ample spooling capacity. All shafts are of special alloy steel, heat-treated.

LARGE CROWNBLOCK IS INTRODUCED BY REGAN

A companion of the Regan extra-heavy traveling block is announced with the introduction of a nine-sheave crownblock, designated as Regan type C. It has a capacity of 650,000 pounds based on a factor 2 on the yield stress. It has a low center of gravity. The height of



the block is decreased, which permits its installation with shorter gin poles. It is constructed with extreme compactness, embodying the nine sheaves in the smallest space possible.

With the exception of the sheave wheels the entire block is constructed from fabricated welded steel blades. An outstanding feature is the adjustability of the sand sheave. It can be placed for use with the drawworks, sand reel, or a special hoist, and will allow the line to be centered from the hole, which is especially convenient for swabbing operations.

The cat-line sheave is adjustable and can be set in position above the driller's head, which is customary in the Mid-Continent fields, or it can be set at a medial point or at other locations as desired.

The block retains all the features of the Regan types A and B crownblocks. The bearing construction is the same, embodying dual bearings for each sheave and an individual rotating pin integral with its sheave. This gives a wider bearing area and is said to prevent the bearing edges from wearing into conical shape. This arrangement of bearings also allows more compact setting of the sheaves. The bearing capacity has been increased in proportion to the capacity of the framework of the block.

The type C crownblock, in combination with the new six-sheave Regan traveling block, will carry loads far in excess of those that have been imposed in deep rotary drilling, according to the manufacturers.

GAS SAVING EFFECTED BY WETZEL SEPARATOR

Pronounced savings in gas are said to attend the use of Wetzel automatic gas separators. There is said to be no loss of syphon gas with the Wetzel on the well, as the necessity of blowing a syphon out into the open is eliminated.

By installing a Wetzel separator on a gas well in which a syphon has been used the syphon is connected into the inlet pipe through the header, which does away with blowing the syphon out into the open. If the volume of gas passing through the syphon is not as great as it is desired to take from any particular well, the side gate may be opened and additional gas may be taken simultaneously with the syphon to satisfy the requirement from that well.

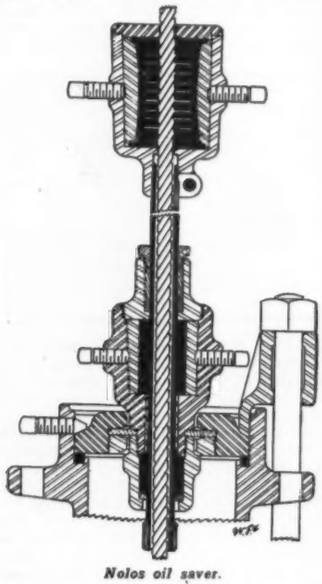
As a result of this it never becomes necessary to shut a well off to blow the water out through the syphon and the well may be operated the full 24 hours of each day without loss of syphon gas or leakage.

The device is distributed by the Norvell-Wilder Supply Co., whose headquarters are in Beaumont, Tex.

Oil Field Equipment and Supplies

NOLOS STRAIGHT LINE OIL-SAVER IS UNIQUE

The Nolos straightline oil saver presented by the Oil Well Improvements Co., Tulsa, is designed to work under exceptionally high pressures and permit



Nolos oil saver.

drilling with the well practically shut in.

A steel jacket surrounds the drilling line to which it is clamped through a special stuffing box which in addition to its function as a clamp, serves also as an oil saver when running tools in or out of the hole. A pair of lugs on the stuffing box allows connection to be made by links to the drilling clamp to maintain a fixed position relative to temper screw.

The steel jacket passes through a lower stuffing box which is flexibly mounted on a base adapted to fit in the top of a control head. The stuffing box can swing to align with the drilling cable and the steel jacket and stuffing box maintain a straightline relationship.

A bottom stuffing box packs off when the jacket is raised to top position and the packing in the main stuffing box may be renewed without danger or loss of oil. The Nolos oil saver will pass through the lubricating chamber on the all-purpose or Type "X" hookups.

AXELSON ANNOUNCES NEW TYPE UNIVERSAL PITMAN

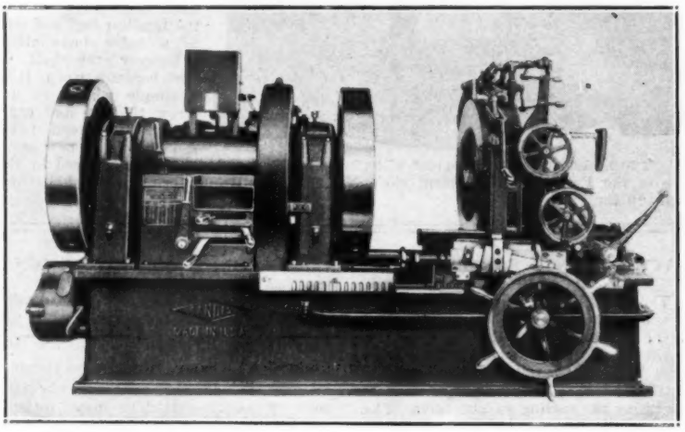
A new type of Universal pitman equipped with Timken roller bearings is now made by the Axelson Manufacturing Co., Ltd. Taking the place of the plain fabric bearings formerly used in the wrist-pin housing on the piston, Timken tapered roller bearings are utilized and arranged in a spherical housing. Their arrangement is such that any possible misalignment between the crank and the walking beam is automatically compensated.

The entire pitman is easy of installation and may be detached from the crank with little trouble. The antifriction bearings are packed in grease at the factory and lubrication is required at infrequent intervals. The installation being completely closed keeps the bearings free from abrasive dirt and foreign matter.

Operation is smooth and efficient. Where the device has been tested the shock which previously had been attributed to the fluid hammer was found to have been eliminated. The pitman has other good features.

LANDIS COMPANY INTRODUCES NEW THREADING AND CUTTING MACHINE

The Landis Machine Co., Inc., Waynesboro, Pa., has developed a pipe threading and cutting machine with a receding chaser, two cut die head and lead screw attachments, designed to meet the exacting requirements for long lengths of tapered threads on high-pressure pipe and oil tubular goods. The receding chaser feature is said to add materially to the accuracy and economy of the Landis pipe threading and cutting machine, not only permitting the cutting of long lengths of tapered threads with narrower chasers, but increasing the life of the chasers between grinds. This is particularly apparent in the threading of seamless tubing. Power consumption for the threading operation is reduced.



A chaser $1\frac{1}{8}$-inch in width is employed regardless of the total thread length. This chaser has a combination turning and threading throat. The scale and surplus stock are removed by the turning section of the throat, thus relieving the remaining portion of the chaser of this heavy duty. The same chasers can be used for any pipe size within the range of the die head, as long as the pitch, taper and thread form remain constant.

The two-cut die head permits of the roughing and finishing cuts without any change in the diametrical adjustment. Both the roughing and finishing cuts are controlled by the one taper mechanism. An independent adjustment of the chaser holder to and from the center insures an equal distribution of the cut. The chaser holders are gibbed and are actuated by the cam ring and tapered rollers mounted on ball bearings. The adjustment for size is universal. In addition there is a universal micrometer adjustment for gauge fits. Each graduation on the micrometer dial gives a variation of .001 inch in diameter.

The taper mechanism is of an exclusive design. It generates a straight line taper or a taper which is uniform throughout the entire thread length. The sine bar is easily adjusted for all tapers up to and including three-quarter-inch taper per foot. A plug provides a positive means of locating the sine bar for three-sixteenths, three-eighths and three-quarter-inch tapers per foot. Provision is made for taking up the lost motion which may develop in time from wear.

The adjustment for thread length is a simple operation. Once set, the adjustment is made permanent by a locking screw.

The sine bar retarding bracket, which actuates the taper mechanism, is adjustable for the length of pipe extending beyond the face of the chuck. It must be set to have contact with the sine bar at the start of the thread. An automatic safety device releases the sine bar retarding bracket should the operator neglect to open the die head when the lead screw nut is automatically disengaged at the finish of the thread.

The lead screw attachment, with change gears for the different pitches, is designed to insure a perfect start of the thread and an accurate lead. The intermediate gears are mounted on a floating carrier of new design, which simplifies the meshing operation. A single nut clamps the intermediate gears and their carrier in place. The gears are enclosed to protect the operator.

The lead screw nut is of the split (two halves) type. In addition there is another segment which can be adjusted longitudinally to eliminate any backlash. These three bronze segments are carried in cast steel jaws and can be replaced when necessary. The lead screw nut is engaged by hand. It is disengaged either automatically at the end of the thread or by hand. A pitch indicator is provided to assist the operator in the engagement of the lead screw nut.

The cutting coolant is supplied to the chasers internally through holes in the bore of the die head. These holes are located so that the cutting edge of each chaser is flooded with the coolant. Quick-acting valves control the supply of the cutting coolant to both the chasers and the cutting off tool.

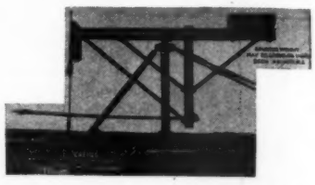
Provision is made for lubricating all sliding and rotating surfaces in both the die head and the machine.

MEASURING SMALL CURRENTS

A hundredth of a millionth of a billionth of an ampere can be measured by means of a new type of vacuum tube developed by the General Electric Co. The electron flow is such that a current expressed as 0.00000000000000001 (or 10^{-17}) ampere, compares with the electron flow through the usual 50-watt incandescent lamp as do two drops of water with the enormous volume of water spilled over Niagara Falls in a year. Something like three quintillion electrons per second (3,000,000,000,000,000,000) flow through the ordinary 50-watt incandescent lamp. The new vacuum tube is able to measure accurately a flow of about 63 electrons per second.

PUMPING JACK DESIGNED FOR HEAVY-DUTY WELLS

The new counterbalanced pumping jack manufactured by the Union Machine Co., Bartlesville, Okla., is designed for heavy duty wells 3,000 to 6,000 feet deep. The beam is made of two 10-inch chan-



nels 16 feet long, double-braced to support all pumping and counterbalance strains. The rope hanger head does not touch the polish rod and has no working bearings or links. The jack sets on old $6\frac{5}{8}$-inch casing and spans the cellar without filling it. The jack is furnished with or without sampson posts of $6\frac{5}{8}$-inch casing, braced with pipe turnbuckles acting as both compression and tension braces. The down bar is of heavy I-beam construction. The stroke adjustment may be double that delivered to the jack by the pull rods.

LARGER TULSA OFFICES FOR WICKWIRE SPENCER

The Wickwire Spencer Sales Corp., New York, which up to the present time has maintained a small office in Tulsa, selling oil field rope, has taken a long-term lease on a building to be erected in Archer Street, that city, and will maintain offices there in addition to a large warehouse stocked with wire rope, chain link fence, Clinton electric-welded fabric, welding rods and other products of the company. The district covered by the Tulsa office includes seven states, Kansas, Oklahoma, Texas, New Mexico, Arkansas, Louisiana and Mississippi.

The Wickwire Spencer Sales Corp. will sell all the commodities manufactured by the Wickwire Spencer Steel Co., and the American Wire Fabrics Corp. will sell all the products manufactured by that company. Both of these concerns are subsidiaries of the Wickwire Spencer Steel Co. The American Wire Fabrics Corp. makes screen cloth, poultry netting, etc.

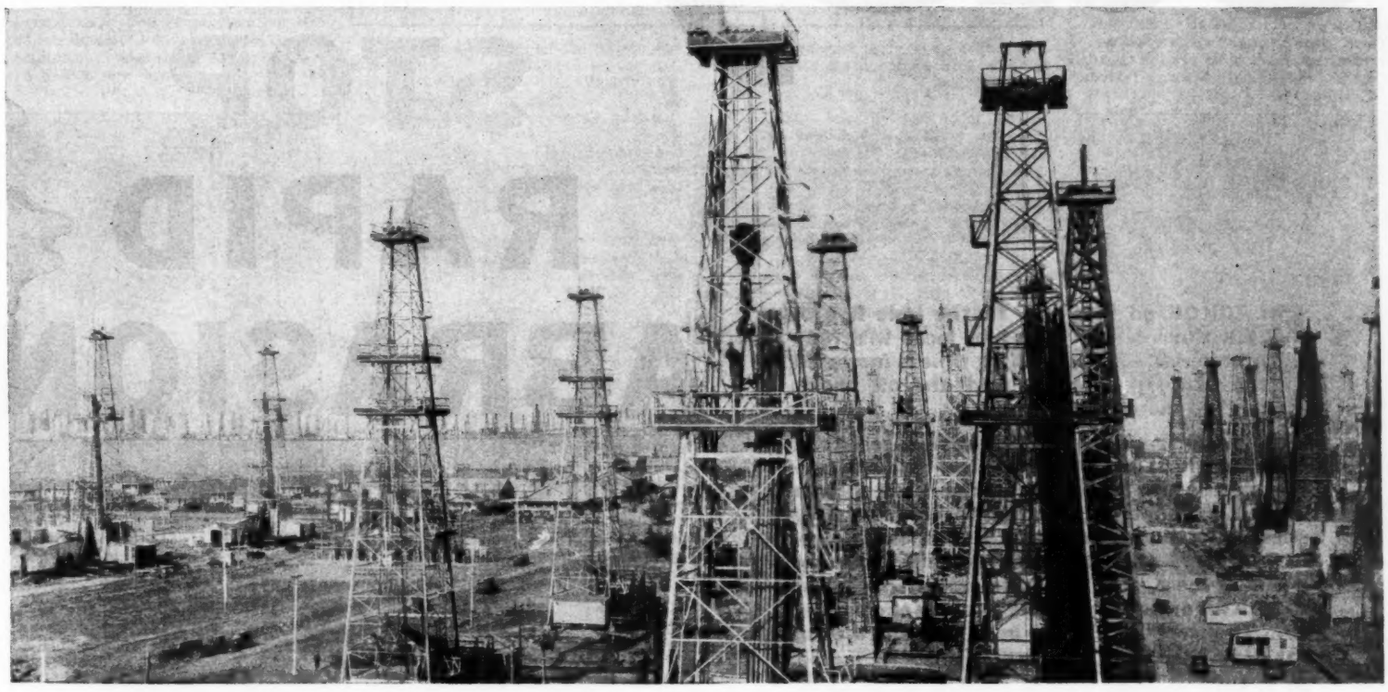
E. L. Stevens will have charge of all sales of both companies. L. J. Baldwin will be in charge of sales of the American Wire Fabrics Corp. J. J. Lovell will be in charge of sales of Wickwire Spencer wire rope. G. L. Crawford will be in charge of Clinton electric welded fabric.

TWO COPPUS APPOINTMENTS

Martin Van Stappen has been appointed sales manager of the industrial blowers and turbine department of the Coppus Engineering Corp., Worcester, Mass. Ernest Kundig has been appointed sales manager of the house heating blower department as well as export manager. The Coppus Engineering Corp. manufactures an extensive line of blowers and turbines for specific fields or industries.

Champion & Barber, Inc., Los Angeles, Calif., manufacturers and distributors of Champion All-Steel rotary hose, Nikeladium steel hose accessories, New Method screen pipe and Champion pressure gauge protectors, have been appointed exclusive distributors in California, Utah, Nevada and Arizona, for the Naylor Pipe Co., of Chicago. Bob Ames is petroleum engineer and sales representative for Naylor pipe.

Strength that Endures
IN THE DEEPEST HOLES



THE strength and toughness of Youngstown drill pipe, tubing and casing has been proved beyond question in thousands of wells—among them many of the world's deepest.

Every length of this sturdy pipe is carefully fabricated to withstand the rigorous hardships of deep drilling. It is high both in tensile strength and resistance to collapsing pressures; it resists the corrosive action of soil and atmosphere; and it withstands the rough handling of field service.

The use of Youngstown seamless tubular goods affords the greatest protection to drilling investment—a statement that has been proved by many years of Youngstown field performance.

THE YOUNGSTOWN SHEET AND TUBE COMPANY

One of the oldest manufacturers of copper-steel, under the well-known and established trade name "Copperoid"

General Offices—YOUNGSTOWN, OHIO

CONTINENTAL SUPPLY CO.—1501 Locust St., St. Louis, Mo.
YOUNGSTOWN STEEL PRODUCTS CO.—3000 Santa Fe Ave., Los Angeles, Cal.
INTERNATIONAL SUPPLY CO.—Tulsa, Okla.
REPUBLIC SUPPLY CO.—2122 E. 7th St., Los Angeles, Cal.

YOUNGSTOWN

GALVANIZED SHEETS PROTECT ∵ ∵ SAVE WITH STEEL

easy TO STOP RAPID ABRASION this simple way . . .

BLACKOR-ed bits stay in the hole five to ten times longer than bits faced with any other material. Actual drilling time is increased in the same proportion and the oil sands are reached more rapidly.

BLACKOR is the genuine abrasion-resistant material which can only be applied with the carbon electric arc. No other method is hot enough to melt this super-hard facing. Instead of merely sticking to the surface, BLACKOR makes a permanent bond with the steel . . . actually becoming a part of the steel. This intimate interlacing of BLACKOR and steel prevents breaking or chipping off. The steel can even be bent without causing the BLACKOR to break off.

BLACKOR provides a surface solidly resistant to abrasion . . . instead of leaving spots unprotected against rapid wear. BLACKOR is the closest approach to diamond hardness and does the work of both hardfacing and insert materials. It can be applied by your own welder or in any job shop at the rate of 100 square inches per hour. An ounce covers about 4 square inches, one layer. A smaller amount of BLACKOR is required to cover a given area, than any other facing. BLACKOR wears evenly and can be applied to give the desired cutting edge.

The quality of BLACKOR is always the same. On account of strict manufacturing control, BLACKOR is absolutely uniform, assuring the operator the most efficient results at all times.

Ten pounds of BLACKOR is sufficient to test this super abrasion-resistant facing in YOUR well. Try it on your tools and note the difference!

Complete details on request.

Blackor is granular in form. Complete working instructions are furnished.

BLACKOR COMPANY

Head Office: 13007 South Main Street
Los Angeles, California

New York Export Office:
39 Cortlandt Street

Tulsa, Oklahoma Office:
410 Thompson Bldg.

Houston, Texas Office:
616 Public National Bank Bldg.

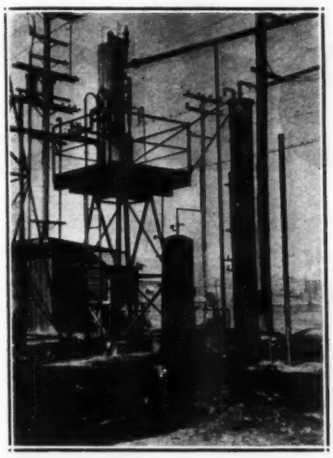
BLACKOR

The Super Abrasion-Resistant Facing

Oil Field Equipment and Supplies

NEW RECLAMATION STILL CLEANS ABSORPTION OIL

A new absorption oil reclamation still has been developed by the Union Oil Co. of California, under the direction of Clare Gard and is now being marketed by the



Trumble Gas Trap Co. of Los Angeles. This still serves the purpose of cleaning up the absorption oil and keeping it clean so that maximum efficiency can be obtained from the plant.

In an absorption plant the absorption oil is intimately contacted with gas and becomes contaminated with foreign matter. The source of this matter may be the gas, compressor plant distillate pumped to stills, incorrectly designed direct fired preheater, or it may be the result of high endpoint gasoline carrying away the light ends of the absorption oil. This dirty oil causes dirty equipment, high pressure drops, low heat exchange efficiency, and loss of gasoline production.

The Gard reclamation still shown in the illustration is constantly reclaiming the absorption oil in a 150,000-gallon plant. The entire oil in this plant was cleaned in approximately 10 days by continually treating a small portion of the lean oil, and the continued operation of the still keeps the oil clean, and keeps the plant free from foreign matter that would otherwise become deposited in absorption equipment, thereby decreasing efficiency.

GE ANNOUNCES TURBINE FOR CENTRIFUGAL PUMP

A new small mechanical-drive noncondensing steam turbine for driving centrifugal pumps, fans and similar industrial equipment operating in general at speeds between 1,750 and 3,600 r.p.m. has been announced by the General Electric Co.

The new turbine is built only as a single-stage machine and has two rows of revolving buckets. It follows the design of the standard line of G.E. mechanical-drive turbines and although simple in construction embodies dependability and reliability. The wheel casing is split horizontally for easy access to the internal parts, and the steam and exhaust pipes are connected to the lower half of the machine. A new centrifugal governor with weights pivoting on knife edges operates with very little friction and provides proper speed regulation. An independent emergency governor is included. The new turbine bears the type designation D-57.

NOTES ABOUT TRADE LITERATURE

The current number of the Armco Engineering Bulletin, published by the American Rolling Mill Co., Middletown, Ohio, deals with the suggested A.S.T.M. specifications for open-hearth plates.

The Link-Belt Co., Philadelphia and Chicago, has issued a folder, No. 1,248, describing its "Cub" portable belt conveyor.

The Worthington Pump & Machinery Corp., Harrison, N. J., has issued a bulletin on the Worthington Multi-V-Drive belt.

A catalog describing the new line of Bristol air-operated control equipment has been prepared by the Bristol Co., Waterbury, Conn.

Technical Bulletin No. 17, published by the International Nickel Co., New York, is a reprint of a paper presented before the American Society for Steel Treating, by Charles McKnight, development and research department of the company. It deals with the manufacture, uses, analyses, heat treatment and properties of nickel alloy steel forgings over 4-inch in diameter or the equivalent.

Improvements are announced by the manufacturers of Kammerdiner rotary drilling jars in a pamphlet just issued. Improvements have been made in the jar mandril and in the method of holding the wash pipe spring in place. A copy of the new pamphlet may be obtained by writing J. A. Kammerdiner, 237 South Highland Avenue, Los Angeles Calif.

The Merco Centrifugal Separator Co., a subsidiary of the Merrill Co. and allied with the Merco Nordstrom Valve Co., has issued a bulletin descriptive of its centrifugal separator for desanding rotary drilling mud. This machine, the bulletin states, is designed for use in central mud treating plants. Its capacity is 10,000 bbls. per day.

A leaflet devoted to type ARZ totally enclosed fan cooled motor is being sent out by the Allis-Chalmers Manufacturing Co., Milwaukee, Wis.

The Landis Machine Co., Waynesboro, Pa., is mailing a bulletin descriptive of the Landmatic head for application to turret lathes. This head has taper attachment, internal mechanism, with hand opening attachment and with sliding adapter.

The Fulton Iron Works Co., St. Louis, Mo., has published a bulletin covering the Fulton type RR Diesel engine, designed for stationary power applications.

The Byron Jackson Co. is distributing a bulletin devoted to Byron Jackson deep-well turbine pumps.

"How to Reduce Operating Costs and Increase Profits," is the title of a folder being sent out by the Edwin Burhorn Co., Bayonne, N. J., manufacturer of cooling towers.

"When a Gas Well Goes Wild," and "The Drilling Contractor Has His Troubles Too," are among articles in the October number of the Yellow Strand, published by the Broderick & Bascom Rope Co., St. Louis, Mo.

The General Electric Co., Schenectady, N. Y., has issued bulletins on G-E synchronous motors for pumping, direct current crane and hoist motors, G-E fractional horsepower motors and motor parts, general purpose squirrel cage induction motors and the G-E quartz rod thermostat.

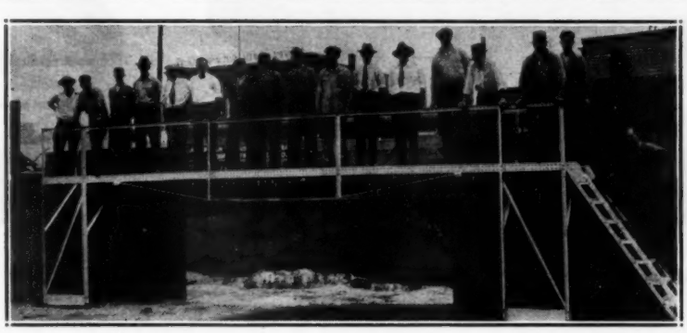
The Hinderliter Tool Co., Tulsa, manufacturer of oil field appliances, has published a catalog of 366 pages covering the entire line. Each page is printed in two colors.

Three bulletins have been issued by the Globe Oil Tools Co., Los Nietos, Calif. Bulletin 8-A features the B-2 and M-5 drilling bits, Model 5 drilling reamer, and Model M rock bit and 3-point reamer. Bulletin 9-A describes hard facing products; Anglite, Diamond-Sub metals and Drillite. Bulletin 10-A is on H. C. Smith coring equipment.

Naylor line pipe is described in an attractively printed 44-page catalog published by the Naylor Pipe Co., Chicago.

A 104-page catalog featuring Brown indicating, recording and automatic control pyrometers has been issued by the Brown Instrument Co., Philadelphia, Pa. A resume of the theory and practice of applied pyrometry is presented.

COLUMBIAN ENGINEERS ARE RATHER PROUD OF THIS JOB



Seeking a steel runway that would give the maximum strength and rigidity with the minimum of steel, engineers of the Columbian Steel Tank Co., Kansas City, Mo., developed the runway shown in the illustration. The photograph was taken at the Columbian experimental grounds in Kansas City. Seventeen men are standing on the runway. In this type of runway the floor is flanged down on each side forming a channel iron effect which, with the truss rods underneath, forms a rigid bridge.

REDUCES FIRE HAZARDS WHEN COMPLETING WELL

The Baird Manufacturing Co., Tulsa, is presenting an improvement in fire fighting devices to prevent or instantly combat the unexpected ignition of oil or

gas while drilling in, reducing the usual hazard.

A means is provided for an internal circular delivery of steam directly into the combustible flowing column by utilizing the velocity of the fluid or gas coming out of the well to create the required pressure necessary to combat the rock pressure of the well, and introduce the steam into the column, for it can be readily seen that 350 pounds boiler pressure will not successfully buck 1,000 pounds rock pressure.

A means is also provided for the external delivery of water, steam, or fire-extinguisher fluids to surround the rising body and put out ground fires on the rig or in the cellar.

The installation is made by screwing the head on each string of casing run where gas is to be encountered. This does not interfere with the normal operation of cable or rotary tools, as the internal diameter of the snuffer is the same size as the casing string. Lines then are connected and run to the boilers, ready for instant opening should the emergency arise.

The ability instantly to fight the unexpected fires at the mouth of the open well flow insures greater safety to men and equipment as well as avoids costly replacements and shutdown time.

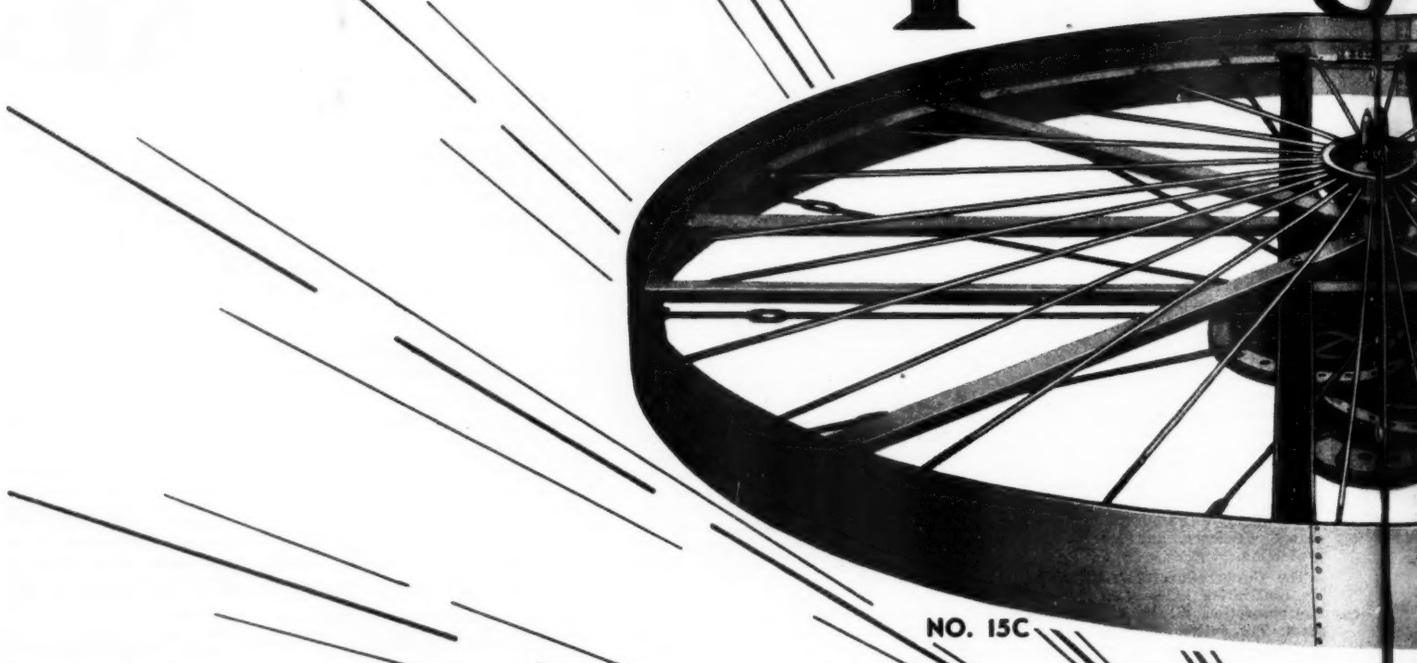
The Oklahoma City fire department watched an interesting test recently when with normal city water pressure of 40 pounds a circular wall of water was forced up around a casinghead for a distance of 25 feet.

The illustration shows the Baird snuffer with a partial inside view. Lips showing inside are recessed back from the wall of the snuffer, and the force of the rising column of oil or gas creates a partial vacuum behind these lips sucking the steam in with the rising column, thus giving the operator all the pressure of the well itself plus that provided by the boiler. Sufficient tie-ins are provided for four boilers if the operators desire that many.

HERCULES GETS FIRST PRIZE

An advertisement of the Hercules Supply Co., Fort Worth, Tex., which appeared in The Oil & Gas Journal last fall was awarded first prize for the best magazine advertisement of the year at the exhibition sponsored by the Tenth District advertising convention which met in Houston, Tex., September 21-23. This ad, one of a series entitled "The Romance of Oil," was a description of a wildcat well. It was prepared by Brennan, Brown & Auld, Inc., of Houston and Dallas.

Natio
Pumping



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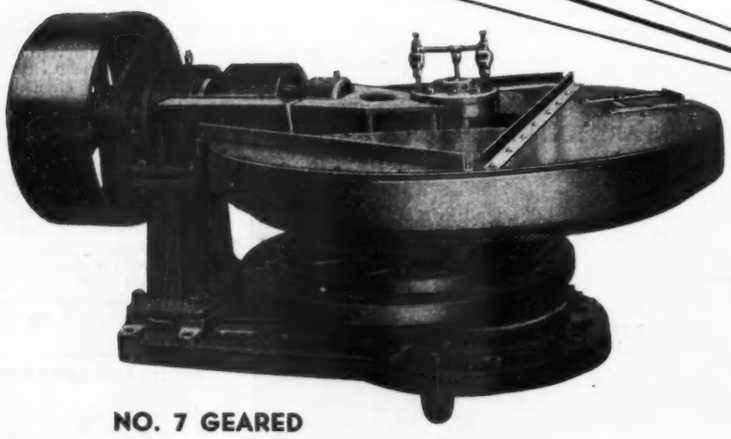

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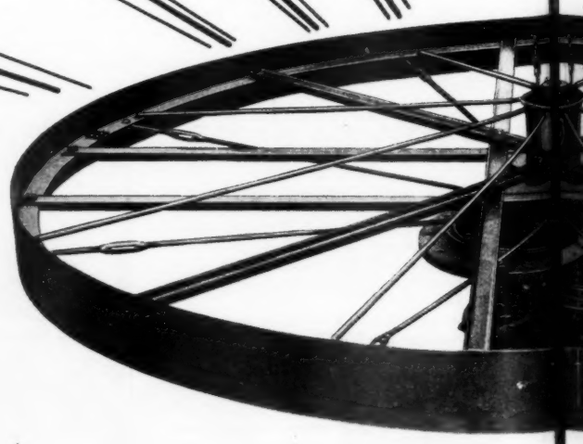

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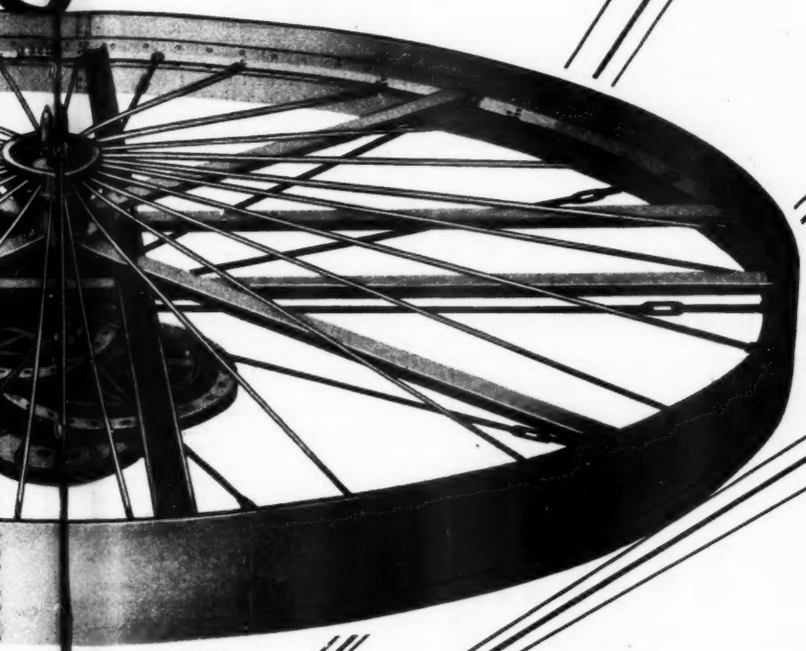

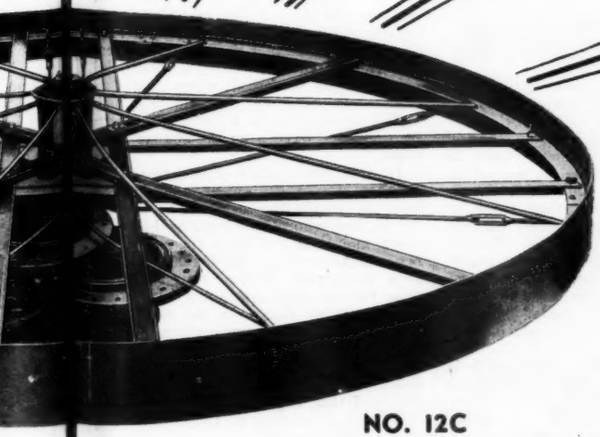

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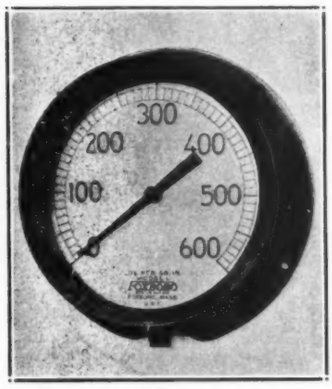
UPPLY COMPANIES

Oil Field Equipment and Supplies

OIL REFINERY GAUGE IS DEVELOPED BY FOXBORO

The Foxboro Co., Foxboro, Mass., has developed an indicating pressure gauge designed specifically for oil refineries. All its parts subject to pressure are steel



and are sweated and screwed tightly into place, to insure against leaks developing as a result of high pressure or high temperature conditions. In case of fire its parts will not give way and thereby add inflammable fluid to the flames.

Particular care has been taken in the detailed construction of this indicator. A special alloy steel Bourdon spring allows the gauge to be operated continuously at maximum scale reading without fatigue. The flanged case is of cast iron and is fume tight. It has a cast iron threaded ring fitted with double thick glass litharged in place. The movement of the gauge is all steel and care has been taken to make it extra sturdy. It has cadmium plated movement-plates, steel hair spring, extra wide bearing surfaces and hardened steel parts to withstand vibration and excessive pulsation. The dial and pointer are of stainless iron to insure permanency and absence of discoloration.

The refinery gauge is furnished only in a 6-inch size with bottom connection, forged steel socket, one-quarter-inch male S.P.T. Pressure ranges available at present are 0-300, 0-600 and 0-1,000 pounds per square inch.

TWO COMPANIES JOIN IN MANUFACTURE OF V BELT

The Goodyear Tire & Rubber Co. and the Worthington Pump & Refinery Corp. have joined their resources in the manufacture of the Multi-V-Drive belt. Goodyear, having designed the special endless V-shaped rubberized cord belts for the drive, will manufacture the belts. Worthington having designed the sheaves and solved the engineering problems of application, will manufacture the sheaves, sell the complete drive, and adapt it to each installation requirement.

The Multi-V-Drive consists essentially of V-shaped rubberized cord belts running over pulleys or sheaves constructed with corresponding V-shaped grooves. The wedging action of the belts in the pulley grooves provides a grip which transmits power at a high rate of efficiency.

Short centers without idler pulleys are now practicable; higher pulley ratios can be used; and bearing pressures may be be lessened by reducing initial belt tension, all as a result of this improved grip. In operation, the belts leave the grooves smoothly at the end of the contact arc with no tendency to bind, or back-pull. As a result, both slip and backlash are eliminated without excessive bearing pressures.

AMONG THE EQUIPMENT HOUSES

The Jackson Engineering Corp., Tulsa, has been awarded contracts for the Gulf Refining Co.'s vapor recovery plant at Neville Island (Pittsburgh), Pa., and a similar plant at Toledo, Ohio. The Burford Oil Co. has awarded Jackson the contract for a vapor recovery plant in Pecos, Tex.

Joe F. Conrin, general manager of the California Columbian Steel Tank Co., Ltd., Los Angeles, visited the Kansas City offices of the company recently for a conference looking to expansion of California operations.

J. P. Dobbins, 733 Mayo Building, Tulsa, has been appointed Mid-Continent representative for the Cleveland Alloy Products Co., Cleveland, Ohio.

The Hercules Motors Corp., Canton, Ohio, builder of heavy-duty engines, has opened an office in the Chanin Building, Forty-second Street and Lexington Avenue, New York. C. P. Weekes, manager of the eastern territory, will make the newly established office his headquarters.

The Superior Oil Co. has awarded the contract to C. F. Braun & Co., Ltd., for construction of a large absorption plant adjacent to its new production at Kettleman Hills. The plant, to be completed about October 20, will have a rated capacity of 110,000,000 feet of gas daily and will produce approximately 150,000 gallons of gasoline.

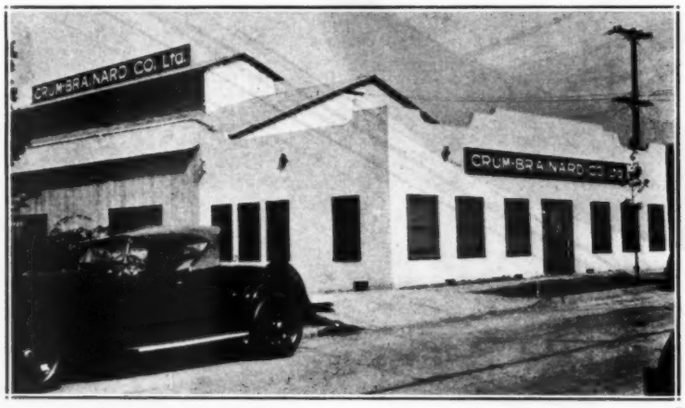
C. C. Fuller has been appointed manager of the Foxboro Co.'s N-ew York office, taking the place of the late W. W. Patrick.

The Hercules Motors Corp. of Canton, Ohio, announces that hereafter the headquarters of the Automotive Products Co., sole distributors of Hercules engines and power units for Great Britain and continental Europe, exclusive of U.S.S.R., will be at Brock House, Langhan Street, London, W. I., England.

F. Hoving has been appointed special oil country representative by the Babcock & Wilcox Tube Co. Mr. Hoving was formerly with the Standard Seamless Tube Co. (later Spang-Chalfant & Co., Inc.) as general superintendent and research engineer.

James A. Harte has been made sales and engineering representative in Tulsa for the American-LaFrance and Foamite Industries, Inc., Elmira, N. Y. For the last 11 years Mr. Harte has been with the company, for three and one-half years as chief engineer.

CRUM-BRAINARD CO. ENTERS MANUFACTURING FIELD



The Crum-Brainard Co., Ltd., with offices and shops in Whittier, Calif., has entered the oil tool sales and manufacturing field. This new concern is headed by R. R. (Rol) Crum and F. W. (Barney) Brainard, drilling and production tool engineers, whose combined oil tool experience amounts to over 50 years. For the present they will carry sales on the Crum-Brainard cathead and the Crum-Brainard rotary booster brake. They will carry both sales and service on the Crum-Brainard core barrels and core bits. Later they will market other tools for both production and drilling.

Mr. Crum is president and general manager of the new company; Mr. Brainard, vice president; E. A. Perkins, secretary and treasurer, and George E. Shetlin, sales manager.

Mr. Crum's experience in the oil industry covers 25 years, 12 of these being spent with the Standard Oil Co. as shop superintendent and four years as vice president and general manager of the H. C. Smith Manufacturing Co. Previous to this time he worked with the Union Tool Co. in Los Angeles and followed this with nine years of experience with other oil tool companies, during which he saw foreign service with the Burma Oil Co. in Burma.

Mr. Brainard's experience in the oil industry also amounts to better than 25 years, during which time he served in both the Mid-Continent and the California oil fields. For the past four years he has been plant superintendent of the H. C. Smith Manufacturing Co. For six years previous to this he was plant superintendent of the Henderson Oil Co. of Graham, Tex. The remaining 15 years of his experience was divided between the Mid-Continent and California oil tool shops.

Mr. Perkins for eight and one-half years was in charge of all field offices for Mohawk Oil Co. and for five years credit manager for the H. C. Smith Mfg. Co. Mr. Shetlin's experience includes five years in charge of field sales of the western division of Hughes Tool Co.; two years as sales manager for the D. & B. Pump & Supply Co., and three years as salesman and field man for the Rotary Oil Well Cementing Co. and the Perkins Oil Well Cementing Co. Previous to 1920 he was in the Mid-Continent fields.

F. J. REYNOLDS JOINS PITTSBURGH EQUITABLE

In line with the policy of departmentalizing its sale organization and placing experienced group specialists at the disposal of the industries it serves, the Pittsburgh Equitable Meter Co., Pittsburgh, Pa., has added Frank J. Reynolds to its sales force.

Frank J. Reynolds

Mr. Reynolds will be associated with the Emco orifice meter and Emco gauge department. He has had 10 years selling experience with the Bristol Co., of Waterbury, Conn., during which time he specialized in the introduction of similar new equipment in a variety of industries from coast to coast. He will be located at the home plant in Pittsburgh.

WATER AND 7 SECONDS EXTINGUISH OIL FIRE

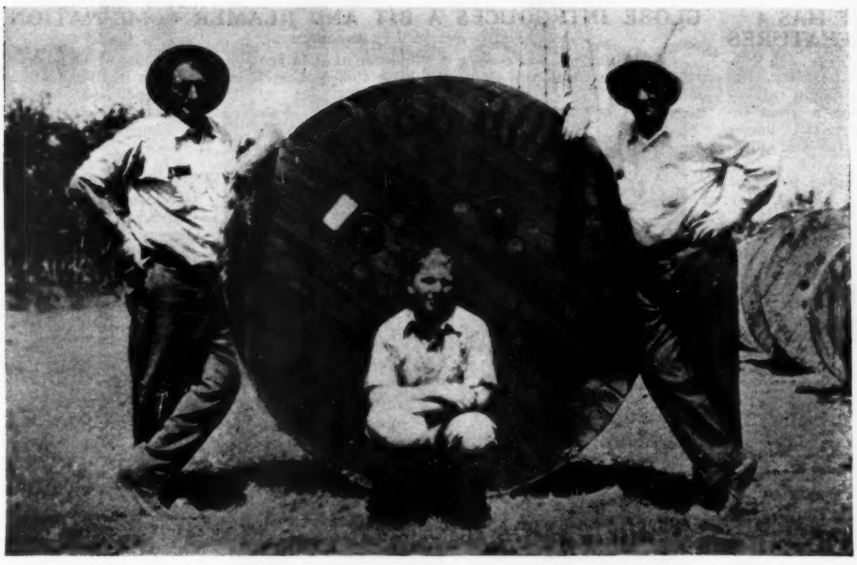
Santa Fe Springs, Calif., was recently the scene of a fire extinguishing demonstration which marked the first public appearance of the water-operated fire prevention equipment manufactured by the Rapid Construction Co., Los Angeles, Calif. This demonstration consisted in extinguishing a burning oil tank fire covering 180 square feet, with three gallons of water in a total elapsed time of 7 seconds, the time element being based on stop-watch reading and the water gallonage being checked through a meter.

It was generally supposed that oil and gasoline fires could not be extinguished by water, that as a matter of fact water aided instead of extinguishing, oil or gasoline fires.

The method used by Rapid Construction in breaking up solid water streams into millions of minute fog particles which cool the fire by the absorption of heat and smother by the absorption of oxygen. In the process of absorbing heat, steam is generated in the space between the fire and the burning material, thereby excluding oxygen. Water placed on a fire in this manner is highly efficient because its cooling effect is multiplied by the heat absorbed when water is changed to steam and its volume is multiplied approximately 1,700 times, thereby excluding oxygen as the change takes place.

In this first public demonstration of the new Rapid equipment, the oil used was 35 gravity live crude. The oil was set on fire, allowed to burn as hot as it could and then the water-fog valve was opened. As soon as the fog hit the fire area it started to die. Seven seconds later the fire was completely out, a fact so remarkable that even the fire chiefs witnessing the demonstration were amazed. Upon examining the surface of the oil after the fire had been extinguished, it was found that no water was left, and that the oil was comparatively cool, with no danger of reigniting on its own accord.

The Petroleum Equipment Co. and the Oil Field Engineering Corp. are placing stocks in Los Angeles, Calif. with G. D. Hall as California representative, maintaining offices and warehouse stocks at 1506 Santa Fe Avenue. Mr. Hall was formerly with the Guiberson Corp. in Dallas, Tex.



Consistent Performance
on DEEP WELLS in WEST TEXAS

Shown above is a 1" x 8000' UNION Drill Cable on Holman No. 1 of the Phillips Petroleum Corporation, 25 miles southeast of Sonora, Texas; drilling at 5300 feet and going to at least 7000 feet. The men, left to right, are: E. E. (Bud) Cribley, Dist. Supt., Phillips Petroleum Corp.; Kenneth C. Cribley, son of "Bud" Cribley; and O. B. (Slim) McCalmont, Tool Pusher at Holman No. 1. In the background are UNION reels used in drilling other deep wells in this area.

Mr. McCalmont says that "UNION Wire Lines inspire confidence by their consistent performance and make less difficult the drilling of deep wells in West Texas."

"Consistent performance" explains the growing number of UNION reels seen throughout the oil country.

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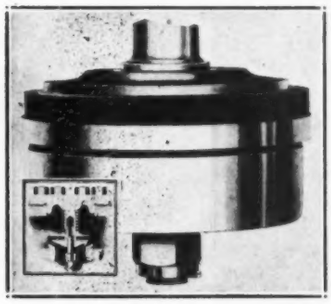
UNION WIRE LINES

Oil Field Equipment and Supplies

MUD PUMP VALVE HAS 4 DISTINCTIVE FEATURES

The Gardner-Denver Co., Quincy, Ill., has announced a new mud pump valve—lighter in weight, but with a great increase in strength which results in longer life, less pounding of the valve, and quicker action.

This new mud pump valve has four distinct features. It is a special alloy



forged valve and valve seat; hardened and heat treated. The valve assembly is entirely self-contained with center pin guide bolted in the seat, doing away with all extra upper and lower guides or bushings. It has a nickel steel guide pin, hardened and ground. There is reduction in weight, along with increased strength.

The valve is of steel forging, hardened and treated, made of special alloy steel. Its extremely hard surface affords long wearing qualities. The valve stem is made of special alloy steel, hardened and treated. It is hollow, allowing a by-pass for the mud. Full guiding efficiency is obtained as no flutes or cuts are required. The stem is easily removed. Special alloy steel, heat treated and drawn, is also used in the valve springs, to give long life without loss of elasticity.

The valve retainer acts as a seat for the valve spring and as a retainer, holding the valve insert in position. A square section spring-ring lock fits in a groove in the valve holding the retainer in position and locking the entire assembly of the valve, valve retainer and valve insert.

The valve seat is a special alloy steel forging, of one-piece construction, heated and treated. Taper fit for the valve seat in the cylinders is ground to exact limits in order to insure perfect fit. Liberal valve area gives the greatest possible volume of mud.

ROTARY HOSE FOR DEEP HOLES

Heavier equipment with increasingly higher pressure pumps for deep drilling has created the necessity for rotary hose built to withstand this severe service. The new Super G.S.M., made by the Goodall Semi-Metallic Hose & Manufacturing Co., Philadelphia, Pa., has been developed to a high degree of strength in construction. It is protected from exterior wear and abuse by the G.S.M. free flexing ball joint steel armor, with inner construction built up with metal members to prevent elongation. The inner tube is of high grade rubber to resist the wear and abrasion from sand and slush mud. Each length of the hose before leaving the factory is tested to 4,000 pounds per square inch in the 2½-inch size.

An attractively illustrated catalog of Hercules explosives printed in the Spanish language, has been issued by Hercules Powder Co., Wilmington, Del. The new booklet, describing explosives, blasting accessories, and smokeless powder, is illustrated with Latin-American scenes.

GLOBE INTRODUCES A BIT AND REAMER COMBINATION

A drilling bit and reamer combination that is proving efficient in the Oklahoma City Field, according to Globe Oil Tools Co., of Los Nietos, Calif., is its B-2 drilling bit and M-5 drilling reamer, shown in the accompanying illustration.

In using this reamer for drilling, particularly in large holes, the manufacturers point out that it is common practice to use a much smaller pilot bit than the diameter of the reamer. For instance, the picture shows a 17-inch B-2 drilling bit used ahead of a 22-inch M-5 reamer, thereby giving better penetration for faster drilling. Having both the bit and reamer on bottom at the same time holds them steady in the hole. Also this method is declared to be conducive to straight-hole drilling, owing to the fact that if the pilot bit tends to go off center, the reamer above holds it in a straight line.

Roy Wilson, driller, is shown in the picture standing beside the combination B-2 bit and M-5 reamer used by the Moran Drilling Co. to make surface hole in the Oklahoma City Field.

TUBULAR SUCKER RODS MARKETED BY DECKARD

Greater pumping efficiency is said to be gained by use of tubular sucker rods, distributed by the Deckard Supply Co., Tulsa. The fluid is pumped through the rod, and deep wells are said to be pumped successfully with this type of rod for the following reasons:

The power required to discharge the fluid is furnished by the weight of the rods themselves, and therefore cushions the impact at the bottom of the stroke, making a smooth pump action possible and eliminating high peak loads.

Greater fluid velocity is attained. Therefore, a much smaller column of fluid is always moving upward on both the up and down strokes. On the up stroke it travels at the beam speed, and on the down stroke it travels much faster; but it is always moving, and moving upward.

The tubular sucker rod having a shouldered joint, threaded to sucker rod tolerances cannot leak, thus the losses from leaky tubing are eliminated. Pitted and leaky tubing need not be discarded as it only acts as a guide for the tubular sucker rods and with proper sucker rod guides and tubing anchor wells can be pumped without the use of tubing.

Owing to stronger rods, less load, less vibration and impact, no tubing leaks, less working pressure, no lost stroke from the rod stretch or gas locks, a higher pumping efficiency is possible. Therefore, the production of a well can be pumped with a smaller barrel, or with fewer and shorter strokes with the same barrel.

The Utility Trailer Manufacturing Co., Los Angeles, Calif., has issued a broadside devoted to the six-wheel principle and Utility six-wheel units. The Leland Equipment Co., Tulsa, is distributor.

RAPID-WORKING SHOVEL OPERATED BY ONE MAN

A one-man tractor shovel, designed for high speed operation and powered by an Allis-Chalmers Model U tractor, has been developed by the Bay City Shovels, Inc., Bay City, Mich. This shovel is recommended by the manufacturer for jobs which do not require heavy machines. One of its features is economy of operation, made possible by its comparatively light weight and its compact design. Another factor which aids low cost operation is the fact that a three-quarter swing enables this machine to maintain part revolving economy. It can work in close, crowded quarters.

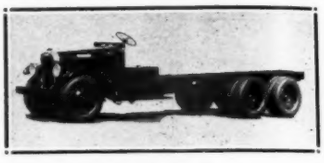
This unit is mounted on long, full crawlers which carry a pressure of only six pounds per square inch of ground surface. The working weight is 10 tons. Construction is all-steel throughout, gears are machine cut and shafting is of special analysis. Timken and Hyatt roller bearings are used. The shovel has three-eighths yard capacity.

The machine is quickly convertible from shovel to clamshell, dragline, trench hoe or skimmer, one man operating in each case. It has three propelling speeds up to four miles an hour, permitting the machine to be moved as desired. The Bay City tractor shovel is not an attachment for the tractor, the Allis-Chalmers power plant being installed as a permanent unit. It is sold and serviced by most Allis-Chalmers tractor dealers.

The Bailey Meter Co., Cleveland, Ohio, manufacturer of power plant metering equipment, automatic combustion control and feed water regulators, has opened a branch office in Denver, Colo., with M. E. Reddick, as manager.

FEDERAL MOTOR TRUCK ENTERS 6-WHEEL FIELD

The Federal Motor Truck Co.'s entry into the six-wheel field is marked by the production of a group of three heavy-duty, six-wheel, tandem drive units known as the U6SW, U6SWAB and the 4C6SW. These new models include the latest improvements in tandem axle de-



Model U6SW

sign, and embody such important advantages as high pay load capacity; wider distribution of weight which minimizes the effect of road shocks, giving greater protection to chassis and load; increased traction with eight rear tires and with the drive through four wheels instead of two; increased braking energy applied on six wheels through a greater number of tires; minimized skidding, tire and operating economy; axle loads conforming with state law limitations; lower taxation and impressive appearance.

The Federal U6SW is rated at six tons and has a gross allowable weight of 28,000 pounds. It is powered by a six-cylinder, 90 horsepower engine with dual ignition. Included in its specifications are 13-inch clutch, seven-speed transmission, 34"x7" tires (dual rears—10 tires), inside frame reinforcements and outside fish plates. It has six-wheel hydraulic brakes.

The Federal U6SWAB is also rated at six tons with a gross allowable weight of 28,000 pounds. It is identical with the U6SW except that it is equipped with Westinghouse air brakes which apply on all six wheels.

The Federal 4C6SW is rated at eight tons with a gross allowable weight of 34,000 pounds. It has a 6-cylinder, 100-horsepower engine with dual ignition; 36"x8" tires, dual rears (total 10 tires); inside frame reinforcements and outside fish plates. The rear axle construction and mounting is the same as the U6SW except that it is larger and of greater capacity. Westinghouse air brakes apply on all six wheels.

GENERAL ELECTRIC HAS LUBRICANT FOR MOTORS

The General Electric Co. has announced a new grease embodying the necessary qualities for proper lubrication of ball and roller bearings. It is used in General Electric factories for the initial lubrication of all general purpose motors using these types of bearings. This lubricant is being successfully used on ball bearing applications with speeds as high as 25,000 r.p.m. and temperature exposures from —25° to 250° F. However, its use is recommended only for the lubrication of motor bearings where the motors were originally grease-lubricated.

Some of the advantages claimed for the new lubricant are: (1) High grade materials are selected for its compounding. (2) It maintains an operating consistency under severe conditions and over as wide a temperature range as will be encountered in service. (3) It allows complete ball and roller motion. (4) There is little tendency to gum-cake or separate. (5) It contains no free acid or water and will not turn rancid. (6) It has unusual film strength, enabling it to stand severe thrusts and heavy bearing loads.

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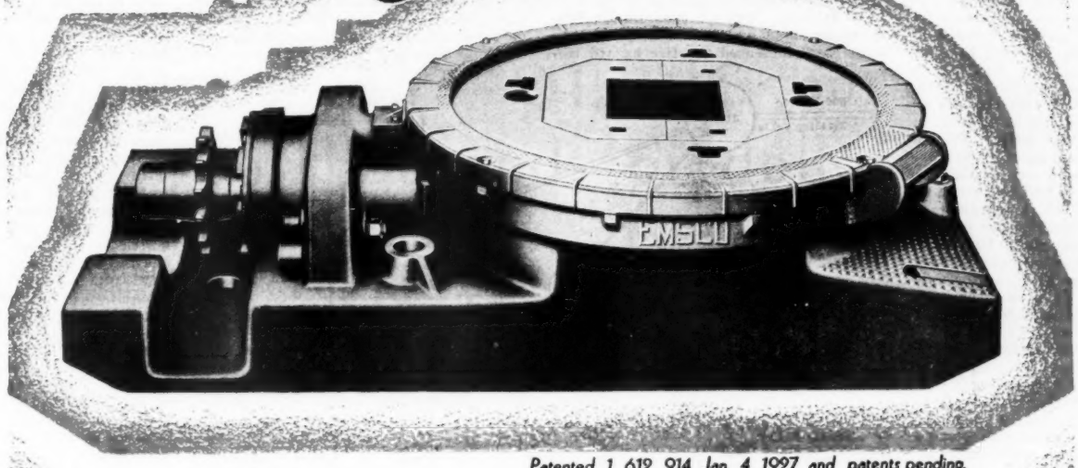

Patented 1, 612, 914 Jan. 4, 1927 and patents pending.

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Removing Sand From Drilling Mud

Union Oil Co. of California Develops New Process for Reclamation of Rotary Mud and Salvage of Sump Oil

By L. P. Stockman

LOS ANGELES, Calif., Oct. 13.—The Union Oil Co. of California, which has pioneered a number of modern improvements in the producing and refining branches of the oil industry, has just finished construction work on a new reclamation system for the treatment of rotary drilling mud and the salvage of sump oil in the Playa Del Rey Field of Los Angeles Basin. The significance which attaches to the completion of this new unit lies in the fact that through its use a substantial reduction is effected in the cost of drilling new wells. This is particularly important when it is considered that the average well in California uses approximately $10,000 worth of drilling mud, most of which represents a dead loss upon the conclusion of drilling in as much as it is discarded. Under the Union's new system this mud can be used over and over again as its separator unit will precipitate cuttings from the well and reclaim approximately 80 per cent of the rotary mud used.

The Union's new installation at Playa Del Rey, which was put into operation last week, consists of a centrifugal separator, four storage tanks ranging from 100 bbls. to 2,000 bbls. each, a skimming or settling tank, an agitator, two pumps, a series of sluice boxes and sufficient pipe line facilities to hook up the plant with its drilling projects under way in this field. It is located on the company's Del Rey lease and was constructed at a cost of approximately $20,000. The total construction cost of this new plant will be liquidated before the end of October, or approximately 30 days after it was placed in operation through the reduction of drilling costs resulting from the reclamation of rotary drilling mud from the four wells being drilled by the Union in this field.

Method of Operation

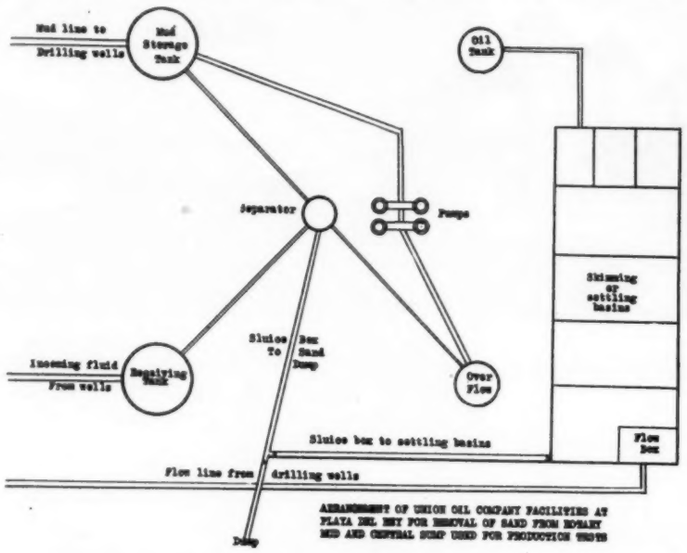
The method of operation consists of pumping rotary mud containing well cuttings from the drilling wells into an open roof 1,000-bbl. receiving tank through a 6-inch mud line. The rotary mud from the wells as it enters the top of the receiving tank passes over a mechanical agitator constructed for the purpose of precipitating as much sand and debris as possible from the drilling fluid. From the receiving tank the rotary mud, sand and water is conveyed by means of a pipe line to a centrifugal separator located approximately 20 feet away. The separating unit precipitates the sand and well cuttings and this undesirable foreign matter is conducted by means of a sluice to a sand dump. The normal rotary drilling mud, which is still in a fluid condition, is pumped over to a 2,000-bbl. mud storage tank. As the rotary mud in this tank settles, water is bled off from the top by opening up one or more of a series of vertical bleeder valves located at frequent intervals on the storage tank.

Surplus material from the separating unit is recovered in a 100-bbl. tank and this is in turn either re-treated or pumped directly into the mud storage tank. A system of sluice boxes is so constructed that, if the rotary mud pumped from wells in the field contains oil, the flow may be diverted to a skimming or settling tank where the oil is recovered and the water and other foreign matter pumped off. This settling tank of cement construction measures approximately 20'x50' and consists of three major settling basins and three minor basins. The oil from this settling or skimming unit upon recovery is pumped into a 250-bbl. tank where it is temporarily stored.

Flow Box

One of the most important features in connection with this skimmer or settling tank is the installation of a flow box which is used during the course of production tests in the field. Under the old order of things, new wells were allowed to flow into the usual adjacent sump until they had cleaned up sufficiently to permit their being turned over to the pipe line department or hooked up with lease storage. The oil thus flowed into the sump hole was usually lost and in most cases increased the fire hazard tremendously. Under the Union's recently constructed system, new wells upon completion are hooked up with a pipe line system which terminates in the flow box constructed in conjunction with the skimmer or settling tank, an integral part of the new reclamation unit. By flowing new wells through the flow box into this settling tank, the oil which was usually lost in the sump, is subsequently skimmed off and recovered. This concentrated reclamation unit of the Union Oil Co. is particularly adaptable to operations in the Playa Del Rey Field because, in addition to effecting a substantial saving through the reclamation of rotary drilling mud and the salvaging of crude oil, it eliminates the necessity of having to dispose of considerable quantities of drilling fluid and cuttings from the wells.

The disposal of mud, water and sand is quite an important factor in many California fields because of the proximity of town lot areas and the extreme precautions necessary to prevent contamination of adjacent bathing beaches. In the congested town lot area of the Playa Del Rey Field, where the average drilling site contains less than 5,000 square feet and consequently affords practically no excess sump space, operators are obliged to haul this used drilling mud sometimes long distances and dump it in some specially constructed reservoir. The dumping of this debris immediately adjacent to Washington Avenue may cause some complications this winter unless some additional protection is afforded and the mud prevented from being washed out during some heavy rain storm.



ARRANGEMENT OF UNION OIL COMPANY FACILITIES AT PLAYA DEL REY FOR REMOVAL OF SAND FROM ROTARY MUD AND CENTRAL SUMP USED FOR PRODUCTION TESTS

Centrifugal Separator

The Merco centrifugal separator, which forms a component part of the Union's new reclamation plant, is a machine designed to separate gritty material from fluid suspension of finer solids. There are no moving parts within the rotating bowl of this machine as it is so constructed that it operates within itself to sluice out and prevent packing of sand material in the zone of separation. This is accomplished by discharging the separated sandy material in a fluid state from relatively large orifices at the periphery of the bowl into a surrounding tank and then recirculating it through the outer part of the bowl. Fresh material to be treated is fed continuously to the bowl and the lighter and finer portion removed from an overflow compartment. At the same time heavy sandy material previously separated is discharged continuously at a controlled density from the surrounding tank. The circulation of the sandy fluid is accomplished by means of a bladed conical chamber open at the bottom which extends from the bottom of the bowl down into the sand fluid in the surrounding tank. The sand fluid flows by centrifugal force up the walls on this return chamber and back into the bowl through pipes. The interior walls of this bowl are sloped in such a manner as to retain a layer of sand over their surface and thus prevent scouring wear on the metal. The orifices discharging the sand fluid face backwards. This feature reduces the power required for circulation to a negligible degree and at the same time practically eliminates wear on the surrounding tank.

The machine adopted by the Union Oil Co. for the separation of sand from rotary drilling mud at Playa Del Rey has a bowl 30 inches in diameter and is driven at a speed of 540 revolutions per minute. It is motored by a 10 horsepower vertical motor attached to the frame and driven by a texrope drive from the motor to the driver pulley on the shaft from which the bowl is suspended. The operating load after starting is probably 3 horsepower. The size of the sand separated from the rotary drilling mud depends on the density and viscosity of the mud and the rate of feeding. Conclusive tests under actual operating conditions indicate the adaptability of the machine to widely varying conditions.

In order to determine the capacity of

(Continued on Page 165)

Separator and pumps used on Union Oil Co.'s new reclamation unit in the Playa Del Rey Field.

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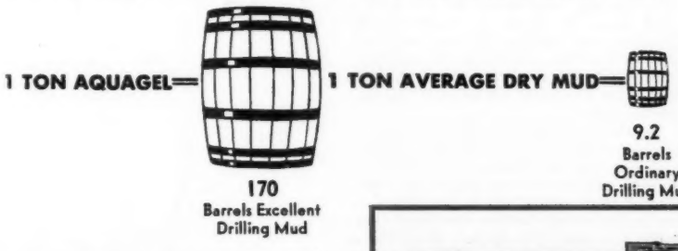
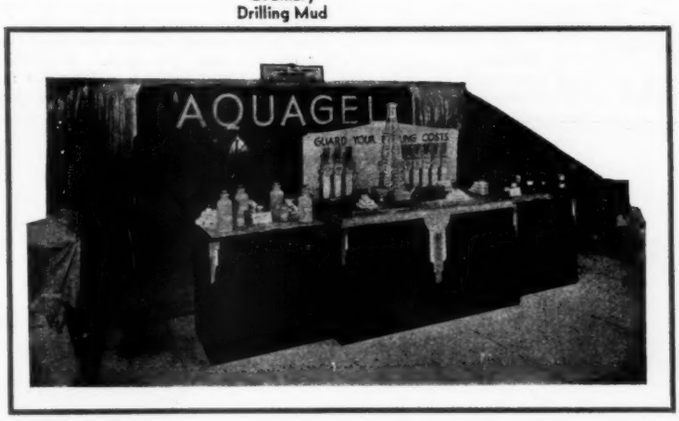
AQUAGEL prevents caving and allows you to drill through caving or heaving shales without loss of time. Each day's time lost fighting cavings costs you at least $100 for labor . . . and each day's time lost completing a well means loss of a day on production. In a well ultimately completed, at 5,000 barrels with oil selling at $1.50 per barrel each day's delay costs you $7,500 . . . A few tons of AQUAGEL will make such a saving possible.

AQUAGEL prevents loss of circulation and gas-cutting, one or the other of which is responsible for 95% of the blowouts. Preventing a blowout may result in a saving of many thousands of dollars . . . Aquagel lubricates pump liners, pistons, drill pipe, casing and walls of the hole, preventing abrasion and lowering power costs. In many wells, the saving in pump parts alone has more than paid for all AQUAGEL used.

AQUAGEL prevents penetration of drilling mud or water into the producing sand when drilling in . . . Water penetrating the sand is responsible for partially mudding off the production of many wells when they are completed . . . The use of AQUAGEL insures maximum production upon completion.



One ton of AQUAGEL, mixed with water, will produce 170 barrels of excellent drilling mud. One ton of average Mid-Continent dry mud such as is used in drilling wells, will produce 9.2 barrels of ordinary drilling mud. Where it is necessary to buy mud, you can afford to pay, on volume basis alone, 18.4 times as much per ton for AQUAGEL as average Mid-Continent drilling mud.



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Properties and Treatment of Drill Mud

Application of Facts and Principles Resulting in Rapid Improvement to Be Increased by Further Investigation

By Hallan N. Marsh
Production Engineer, General Petroleum Corp. of California, Los Angeles, Calif.*

The subject of mud sounds so simple, uninteresting and unimportant that it has failed to receive the attention that it deserves, at least as applied to the drilling of oil wells. As a matter of fact, it is one of the most complicated, technical, important and interesting subjects in connection with rotary drilling. In 1923, R. E. Collom said: "It should be possible to establish certain physical standards for mud fluid," but while considerable work has probably been done on the subject before and since that time, and numerous articles have been written, the progress of general knowledge of the subject and the application of better practices have not kept pace with other developments in rotary drilling, and physical standards cannot be considered as established.

Mud is apt to be thought of as an accessible and cheap material, but its cost is likely to be an important factor in the total cost of drilling a well. Some wells "make" most of their own mud out of the formations drilled, but in most cases a great deal of mud-making material has to be supplied from more or less distant sources. Expenditures for mud materials by one California company totaled practically $250,000 during 1929 and averaged about $13 per rig per drilling day, or about $2,000 per well. Under unfavorable conditions, mud cost may reach many times this figure. Parker says that in the Hobbs, N. M., Field "as much as $75,000 has been spent on one well alone for mud and mud-weighting compounds." Unit cost of mud fluid will range from 10 cents per barrel, where suitable material is close at hand, to $1 where crude material is available at moderate price but must be hauled long distances, and on up to as much as $11 per barrel where high gas pressure requires the use of special processed weighting material.

The cost of mud pales into insignificance, however, when the results of using improper mud are considered. Blowouts and lost circulation are obviously the result of inadequate mud. Stuck drill pipe, whether or not twisted off, in many if not most cases probably is caused by cuttings settling out of the mud or the mud itself precipitating. Recent experience has demonstrated that rate of wearing out of mud pump valves, liners, pistons and rods can be reduced enormously by elimination of cuttings from mud.

Aside from the fact that the importance of the selection and care of mud has not been fully appreciated, the slow progress of the subject has undoubtedly been due to the fact that it involves scientific knowledge of colloidal chemistry and physics, familiarity with technical processes most commonly encountered in the ore-dressing industry and practical knowledge of rotary drilling practice. Undoubtedly there are many chemists to whom the following dissertation will appear superficial and perhaps in some details incorrect, and some practical oil men whose experience will have proved some of the suggestions advanced to be inapplicable. However, it is hoped that a discussion of the subject from a partly theoretical and partly practical point of view will call the attention of the more scientific faction to the nature and importance of the problem, so that they may bring their knowledge to bear on it, and also suggest to the operating personnel theoretical possibilities of which some may prove practical.

Properties of Mud

In the ultimate analysis all properties of muds are the result of, and might be expressed in terms of, the specific gravity, fineness and concentration of the solid particles, and their degree of dispersion as determined by the presence in the water of alkali or acid, emulsifying agents and peptizing agents, which affect the degree and form of dispersion of the solids. However, the effects of these fundamental factors are not well understood even by the colloidal chemist, and much less by the layman. It is therefore convenient to consider the various properties under the following headings, which are of direct significance:

1. Specific gravity or weight per unit volume.
2. Mechanical analysis or fineness of solids.
3. Consistency (viscosity; plasticity; degree, nature and permanency of dispersion).

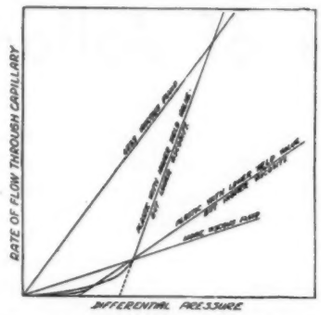

Figure 1—Characteristics of fluids and plastics.

Viscosity is determined by slope of curve.
Yield value (of plastic) is determined by intercept on pressure axis of extension of straight portion of curves.
Note that dissimilar materials may have same apparent viscosity at certain rates of flow, indicated by intersection of curves.

Weight

It has been customary to judge the quality of a mud largely by its "weight" or "thickness," the two terms being considered more or less synonymous. It may be stated emphatically, however, that weight (specific gravity) and thickness (consistency) are independent properties and must be separately considered. A mud may be heavy enough for all but the most extreme conditions and still be a little thicker than water. On the contrary, a mud so thick that it will not flow in a ditch may be as light or lighter than water, thus permitting blowouts in territory of moderate pressure. The specific gravity or weight per unit volume of a mud is a definite and important property. Sufficient weight is required so that hydrostatic head of the mud in the hole will exceed the pressure in the formation being drilled through, and thereby prevent blowouts.

Weight of mud is commonly determined by weighing a definite volume in a bucket suspended from a spring balance. This method is accurate enough for ordinary purposes if done with sufficient care but is apt to be so far from correct as to be entirely misleading if the work is carelessly done with dirty, rusty or otherwise unsatisfactory balances. A weighing device is now on the market which resembles a hydrometer and comprises a small mud sample cup with cover which is hung on a calibrated float in water. The weight or specific gravity of the mud is read directly on the float. This is convenient and accurate if used intelligently. The water in which it is used must be nearly at standard temperature and moderately free from salt. Two continuous indicating and recording mud weight gauges are now on the market which are fairly accurate if properly maintained.

Specific gravity of mud, of course, is dependent upon the percentage of solids and their specific gravity. It may be increased within moderate limits by merely adding more solids, but a point is soon reached at which further additions would make the mud too thick. More solids may be added without making the mud excessively thick by using certain chemicals which tend to hold down the viscosity, but this is not commonly done. If still more weight is required, it is secured by adding some finely ground mineral of high specific gravity or by making a mud entirely of such material.

Mechanical Analysis

The coarseness of the material comprising the mud is important because it affects consistency and weight, and also because it has a marked effect upon the life of pump parts. An approximate idea of the percentage of coarse constituents can be obtained either by a settling test or a centrifuge test. For the former, Lytel recommends diluting 100 cc. of mud with 400 cc. of water in a glass graduate. After a few minutes of settling a majority of the coarse constituents will go to the bottom and their volume in cubic centimeters is equal to the percentage in the original mud. Cartwright recommends the centrifuge test, using the methods and equipment used to test oil. This was previously recommended and data presented by Collom. Lytel finds that in many cases centrifuging is unsatisfactory, either because the line of demarcation between coarse and fine material is indefinite or because the position of this line varies widely with length of centrifuging and time of standing after centrifuging. In spite of objections, however, this test is good for field use because it can be made easily with equipment available for oil centrifuging and by methods familiar to the oil testers, and undoubtedly gives some information.

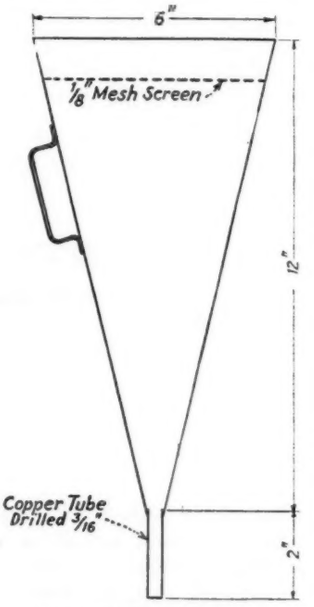

Figure 2—Funnel viscosimeter.

Measurement of viscosity made by pouring 500 c.c. of fluid into funnel and measuring time of efflux with stop watch.
Hold finger over orifice while pouring in mud and until starting stop watch.
Check with water occasionally. Time of efflux for clear water should be 18.5 seconds.

The size of the coarser constituents can be determined by a screen analysis. Such analyses are extremely illuminating and should be more generally used. The finest screen ordinarily available is 325 mesh (325 wires per inch) and the material that goes through this screen may or may not be fine enough to remain in suspension indefinitely, as the openings in such a screen are 0.0017 inch wide

(Continued on Page 161)

TABLE 1—MUD DATA

Date—	Well: Depth ft.	Well: Casing, size at 240 ft. in.	Well: Status	Mud: Weight, lb. per cu. ft.	Mud: Viscosity seconds	Mud: Sand (Settling) per cent	Loss bbl. per hour	Remarks—
5-12-30	1,707	18	Coring	78	31	17		
5-13-30	1,712	18	Coring	75	34	18	None	
5-14-30	1,732	18	Coring	74	30	25	None	Using
5-15-30	1,759	18	Coring	75	37	30	None	untreated
5-17-30	1,811	18	Coring	76	35	25	None	water.
5-20-30	1,930	18	Reaming	76	43	23	None	
5-23-30	1,967	18	Coring	75	28	26	None	
Average before using treated water					34	23.4		
5-27-30	2,066	18	Coring	76	23	6	None	Mud fluid washed to reduce sand content.
5-28-30	2,112	18	Coring	75	30	7	None	
5-29-30	2,151	18	Coring	77	41	15	None	
5-30-30	2,151	18	Reaming	77.5	43	12	None	
5-31-30	2,198	18	Coring	76.5	37	12	None	Using
6- 1-30	2,199	18	Reaming	77.5	41	10	None	treated
6- 5-30	2,271	18	Coring	77	41	12	None	water.
6- 6-30	2,301	18	Coring	75.5	35	8	None	
6- 8-30	2,366	18	Reaming	77	42	12	None	
6- 9-30	2,377	18	Coring	76.5	37	9	None	
Average since using treated water					38.6	10.6		

TABLE 2—EFFECT OF KIND OF WATER UPON SPECIFIC GRAVITY
All Muds Made to Viscosity of 22½ Seconds, Funnel Viscosimeter

Water	Material A: Solids, per cent	Material A: Specific gravity	Material B: Solids, per cent	Material B: Specific gravity	Material C: Solids, per cent	Material C: Specific gravity	Material D: Solids, per cent	Material D: Specific gravity
1	13.1	1.07	41.6	1.32	37.4	1.32	4.3	1.02
2	12.6	1.08	37.6	1.31	39.5	1.32	6.0	1.03
3	13.0	1.08	35.5	1.30	38.2	1.31	4.8	1.03
4	12.4	1.08	40.7	1.32	39.6	1.32	4.3	1.01
5	12.5	1.07	36.4	1.30	37.4	1.39	6.2	1.01
6	13.1	1.06	37.6	1.33	40.2	1.33	4.6	1.02
7	18.8	1.13	42.4	1.33	45.0	1.37	7.5	1.05
8	17.2	1.10	38.4	1.33	36.8	1.29	3.9	1.03
9	15.9	1.09	35.5	1.32	36.0	1.30	4.8	1.03
10	10.6	1.08	37.4	1.32	34.3	1.29	6.1	1.04

*Before petroleum division, A.I.M.E., Tulsa and Los Angeles, Calif.

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Characteristics of Drill Mud Fluids

Composition From Chemical and Physical Standpoint Must Be Studied to Properly Account for Differences

By C. P. Parsons
Halliburton Oil Well Cementing Co., Duncan, Okla.*

To properly account for the various characteristics of drilling muds obtained in different areas and geological horizons, it is necessary to study the composition of the mud from a chemical and physical standpoint as determined by the proportions and activities of the various solid constituents that are present in various states of division.

Briefly summarized, science teaches us that there are three states of divisions into which these solid constituents or particles may be grouped; namely, the suspended state, the individual particles of which are known as suspensoids; the colloidal state, in which the individual particles are termed colloids; and the crystalloidal state, wherein the individual particles are held in true solution and are termed crystalloids.

The suspended state, wherein the individual particles are known as suspensoids, is one wherein the particles are fairly large and are present as molecular complexes, having none of the properties of colloids or crystalloids. Since matter varies in physical character and in chemical activities with its state of division, these coarser particles or suspensoids do not themselves materially affect the physical or chemical properties of the solution in which they are suspended. On the other hand, they are distinctly detrimental in drilling muds and it is desirable that they be removed. Under the general classification of suspensoids are included sand, gravel and cuttings which contribute nothing to the colloidal stability or other desirable properties of the drilling fluid.

As the state of division approaches, but does not reach a molecular simplification, the term "colloidal state" is used in describing this condition. The colloidal state, the individual particles of which are known as colloids, arises when one form of matter is in a very fine state of division and is distributed through a second phase. The material in the finely divided state is called the dispersed phase, while the liquid in which it is dispersed is called the dispersive phase. These particles of matter are in a colloidal state and will not settle out from the dispersive phase so long as colloidal conditions are stable. Moreover, they exhibit the property of having an oscillating movement around a central position in solution (the Brownian movement).

The third state of division is the crystalloidal state, the individual particles of which are known as crystalloids. These particles are held in true solution and are usually present as single molecules or ions. In a drilling fluid the water content of the fluid contains considerable crystalloidal matter, usually in the form of soluble salts. Solutions of crystalloids have different physical properties, in so far as boiling point, vapor pressure, etc., are concerned, from the solvent in which the crystalloids are dissolved. Colloids, on the other hand, exert very little or no effect on the physical constants of the dispersive medium. Some colloids have absolutely no effect on these properties, while others do possess such influences to some degree; depending on whether the colloidal particles more nearly approach the suspended or crystalloidal states, respectively.

Colloids are very susceptible to coagulation by chemicals, heat and electrolytes and possess great absorptive and adsorptive powers. These properties are of extreme importance in rotary drilling fluids and present a formidable basis for unlimited study. The latter part of this paper presents some interesting laboratory results along this line.

Properties of Drilling Fluids

One form of flocculation or agglutination of colloidal materials in drilling fluids is due to neutralization of the electric charges which these materials carry. For instance, a clay suspension having negatively charged colloidal particles is flocculated by materials carrying positive charges. Since like charges repel and unlike charges attract, mixed charges vary in stages of neutralization and flocculation. Such properties present possibilities for chemical treatment of rotary drilling fluids whereby thickening or thinning may be obtained by the proper selection and combination of chemical reagents. In addition to the effect of electric charges, there are other influences brought about by adsorption, which can be made to either sensitize a colloid to where it is more easily flocculated (precipitating a gel on the interfaces of the particles) or which may act as a protective agent to retard flocculation and increase the stability of the colloidal suspension.

In drilling fluids we are concerned with colloids having the property of combining with water solutions to form gels. Gel is the general term for a solid or semisolid colloidal state; gelatinous precipitates and jellies being two forms of gels.

A stable colloidal solution as applied to drilling fluids consist of very fine solid particles kept from settling by a protecting film or agent, usually either protective colloids or electrolytic action or both, such condition being sufficiently rugged to constantly withstand the severe mechanical agitation and chemical con-

(Continued on Page 113)

*Presented at the Tulsa meeting of the American Institute of Mining and Metallurgical Engineers.

Laboratory No. 104
Halliburton O.W. Cem. Co.

Sample No	1	2	3	4	5	6
Location of Well	West Columbia, Texas.	Pierce Junction, Texas.	Van, Texas	Voshell, Kansas	Oklahoma City.	Ventura, Cal.
Color	Lt. Brownish Gray.	Lt. Brownish Gray.	Gray	Gray	Dk. Brownish Gray	Dark Gray.
Sp. G.	1.205	1.205	1.205	1.205	1.205	1.205
Wt/gal.	10#	10#	10#	10#	10#	10#
Litmus Reaction	Slightly Basic	Slightly Basic	Strongly Basic	Slightly Basic	Strongly Basic	Slightly Basic
Viscosity in Centipoises at 100°F.	1.42	1.18	1.47	1.31	1.17	1.14

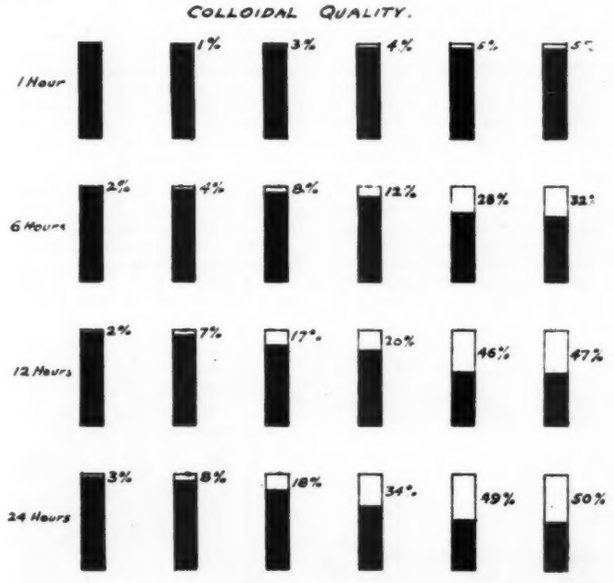
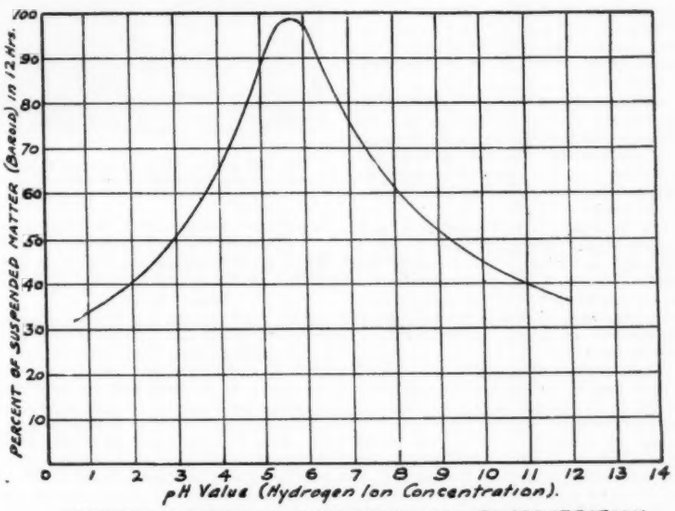


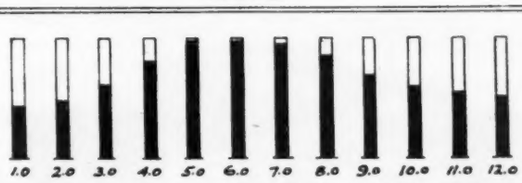
FIG. 1
CHARACTERISTICS OF 6 SAMPLES OF DRILLING FLUID TAKEN FROM WELLS IN VARIOUS AREAS.

Figure 1—Showing the characteristics of six samples of natural drilling fluids taken from wells in various areas.



SHOWING EFFECT OF HYDROGEN ION CONCENTRATION ON THE COLLOIDAL QUALITY OF A BAROID-WATER MIXTURE.
Mixture = 25% BAROID TO WATER, BY WEIGHT.

FIG. 3



SHOWING EFFECT OF HYDROGEN ION CONCENTRATION ON THE COLLOIDAL QUALITY OF A BAROID-WATER MIXTURE (25% BAROID TO WATER, By Wt.) AFTER SETTING 1½ HRS.

FIG. 4

Laboratory, No. 105-6
Halliburton O.W. Cementing Co.

Figure 3—Showing graphically the effect of hydrogen ion concentration on the colloidal quality of baroid in 12 hours after agitation, using a 25 per cent baroid, by weight, mixture with water solution of varying hydrogen ion concentration.

Figure 4—Showing graphically the same effect as Figure 3 on baroid in 1½ hours after agitation is stopped.

Drilling Mud Reclamation at Ventura

Installation and Successful Operation of Central System Described. Many and Varied Problems Encountered

By G. L. Benjamin
Engineer, The Dorr Company, Los Angeles

The installation and successful operation of a central rotary drill mud reclamation plant at Ventura, Calif., by the Associated Oil Co. has aroused a great deal of interest in petroleum circles recently and will no doubt go a long way toward bringing the perplexing mud problem to a satisfactory conclusion.

Problems encountered in the use of drill mud have been many and varied, ranging from the production and maintenance of a heavy, thin, slow settling mud with a high absorptive capacity for water to the disposal of the large amount of waste mud accumulating in active fields.

At the extreme depths to which present day wells are being drilled, the importance of good drill mud is more than ever to be emphasized, if the mud is to perform satisfactorily the functions for which it is intended. If it is to remove rock cuttings of all sizes to the surface, keep the hole from caving without the immediate use of casing, and hold gas, oil, and water in check against the hydrostatic pressures at 5,000 to 10,000-foot depths, the mud flow must not be hindered by contamination with sand, gas, oil, or water.

Sand reduces the plastering action of the mud, increasing the tendency for the well to blow out, and is highly destructive in its abrasive action on the bit, pumps, and drill stem. During a suspension of drilling, sand in the mud settles around the drill stem and often causes it to twist off when operations are resumed.

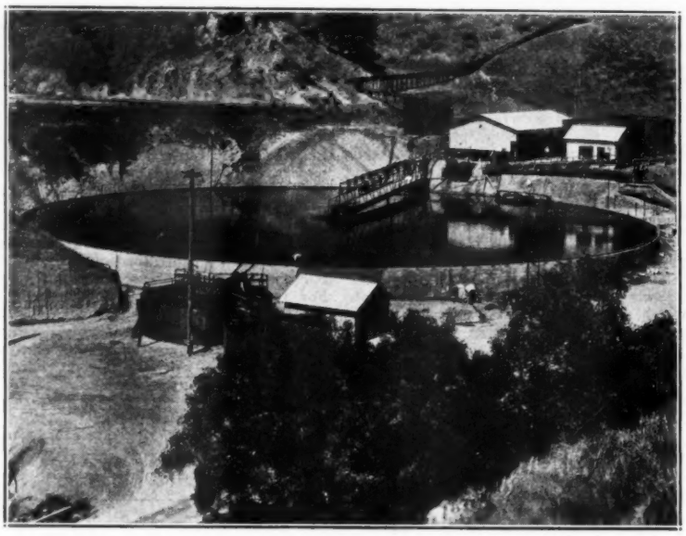
Gas, introduced into the mud in drilling through gas strata, lightens the mud, reducing the hydrostatic pressure of the mud column and the size of sand particles that can be supported by the fluid, and reduces the plastering effectiveness of the mud.

Oil in drilling fluid emulsifies with the water and mud, and such an emulsion will not plaster the walls of the hole efficiently. It is of considerable importance also that with oil already present in the mud, the driller cannot detect the presence of an oil sand by oil showings in the mud.

Water reduces the weight of the mud, and so cuts down its sand carrying capacity, its plastering ability, and the hydrostatic pressure of the mud column.

Any satisfactory treatment of waste rotary drill mud, then, must provide for the economical removal of objectionable quantities of each of these impurities.

Prior to the construction of the new reclaiming plant at Ventura, all the mud used in the wells was furnished by a central mixing plant. This plant simply mixed the mud from a near-by quarry with water or thin mud and pumped it to the wells as they required it. When the mud in circulation at the wells became fouled with impurities, it was discarded and flowed through flumes to one of three or four sumps or catch basins. Usually water was added to the mud to make it flow down the flumes. The sumps were skimmed by pumps mounted on scows, and the thin mud slurry thus removed was pumped back to the central mixing plant for making up fresh mud. The bulk of the solids, sand and clay, remained in the sumps.



The reclamation plant in operation at Ventura, with Dorr thickener in the foreground and showing the waste mud flume which feeds the plant. At the extreme right a scraper is shown spreading out the clean, dry sand product produced in the classifier.

System Described

The mud system at each individual well is a closed one, as shown in Figure 1, the mud passing from the circulation tank into the hole and out of the hole through a sand settling ditch or flume, back to the circulation tank. When the mud becomes sufficiently contaminated as to render it unfit for further use, it is discarded from the system and fresh mud is drawn from the storage tank. Since the installation of the reclamation plant, the system at each well is closed-circuited with this plant, which handles all waste mud and furnishes each well with a drill mud of uniform high quality. Under the old system, however, the storage tank was supplied by the central mixing plant, and the waste mud sent to the catch basins.

As the spent mud in the catch basins accumulated, it became necessary to build up the dams forming the sumps, and to construct new dams when the old ones had been built so high as to be dangerous. One sump at Ventura, for example, is 2 or 3 acres in area, with a mud depth of 50 feet. The maintenance costs of these sumps and the expense of building new dams were so high as to form a large part of the cost of the mud. The only alternative for this system was the adoption of a radically different procedure which would eliminate the necessity for sumps and the mining and mixing of fresh mud entirely—namely, waste mud reclamation.

The requirements for a satisfactory reclaiming plant are rather rigid. It must be adapted to the handling of the mud as it is wasted from the wells, regardless of the quantity, dilution or contamination with sand, oil or gas. It must operate with little or no fresh water, and likewise there should be little or no excess water to waste. The sand produced should be of such characteristics as would enable its being readily disposed of, without the necessity of building sumps. It must produce a mud of high enough specific gravity for use in the wells, with all objectionable impurities removed and the other desirable physical properties, viscosity, colloidal content, etc., must not be destroyed. An attractive feature might be the recovery in the mud of the weighting materials such as hematite and barytes frequently used for increasing the specific gravity of the fluid while drilling. Finally, it must be economical in its operation, furnishing reclaimed mud at a minimum of labor, maintenance and power costs, so that its use would not be prohibitive over present practice.

Small Pilot Plant

As far back as 1922 certain progressive companies became interested in applying methods which had proved successful in other industries, to continuously reclaiming rotary drill mud, and a number of tests were run from time to time on muds from different fields. In 1929, faced with the expense of building new waste sumps, the Associated Oil Co. installed a small pilot plant at Ventura in an effort to reach some definite conclusion on the problem.

This plant consisted of a Dorr thickener and a Dorr bowl classifier with auxiliary pumping and storage equipment. It was operated over a period of several weeks under all conditions of feed quantity, dilution and contamination.

The waste mud was first diluted and fed to the bowl classifier. The bowl overflow was then elevated to the thickener feed-well, while the sand was delivered by the classifier rakes as a clean, dry product. Gas was effectually liberated by the combination of dilution and agitation in the bowl classifier.

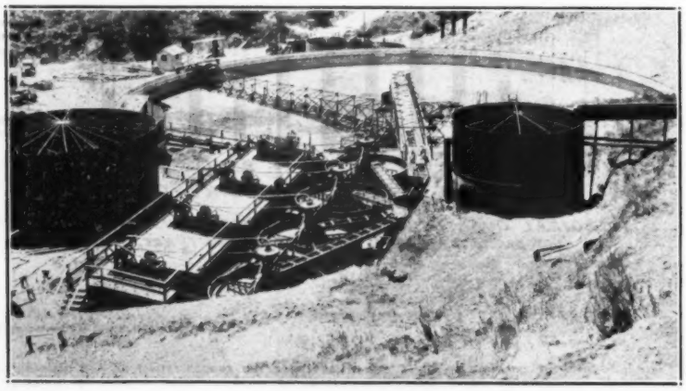
The excess water overflowed the thickener as clear water and was returned for use in the bowls. The oil was entrapped within a circular baffle on the surface of the thickener and was skimmed off at intervals. The thickened mud was withdrawn continuously as the underflow by a diaphragm pump, a finished product ready for reuse in the wells.

Conclusions Reached

The following conclusions were the result of these tests:

1. The combination of a Dorr bowl classifier and a Dorr thickener will produce from used rotary drill mud a reclaimed product containing approximately 2 per cent + 200 mesh sand, and weighing about 80 pounds/cubic feet or over. The mud as delivered to the wells from the central mixing plan contained over 6 per cent + 200 mesh at the same gravity.
2. The operation of the plant and the quality of the product is not materially affected by variations of quantity, dilution, or contamination of the used mud.
3. Gas, oil and water can be removed just as effectively as sand.
4. A sand product could be produced

(Continued on Page 113)



A general view of the plant showing the classifier and thickener installation with the auxiliary storage tanks installed.

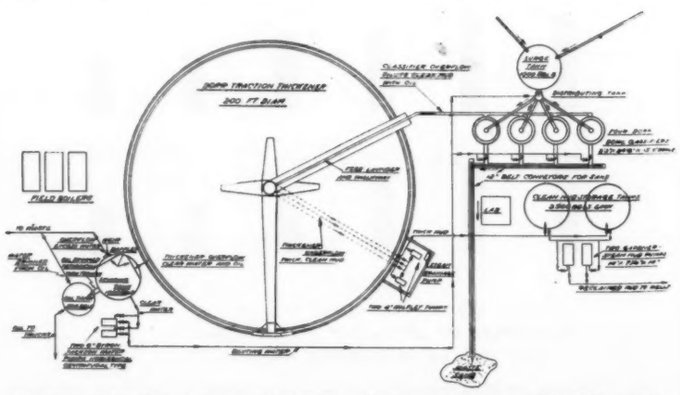


Figure 2—Flow sheet of waste rotary drill mud reclamation plant, 10,000 bbls. per day.

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BY CHARLES K. FRANCIS, PH.D. TECHNICAL EDITOR

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Those connected with the refining of crude petroleum, the manufacture of natural gasoline and closely allied industries are invited to submit their problems to Dr. C. K. Francis, technical editor. The department was created for the purpose of aiding managers, superintendents, engineers, chemists and all those engaged in the various phases of plant operation; also those connected with the marketing and utilization of petroleum products.

Questions should be submitted in as much detail as possible so as to assure a satisfactory answer.

All inquiries should be signed and if other than the given initials are to be used please indicate the desired letters.

Questions involving patented processes, intricate formulas and calculations and estimates of costs, for obvious reasons, cannot be answered. The replies will appear on this page within a reasonable time.

SOURCE OF HYDROGEN FOR HYDROGENATION PROCESS

Would you publish how hydrogen is derived for the hydrogenation process? Also, if the reaction can be directed to the manufacture of benzene and toluene by variations in temperature and pressure?—J. B.

There are no special features surrounding the source of hydrogen to be used in hydrogenating petroleum residues other than that the hydrogen must be obtained cheaply enough to come within the economics of the operation. R. T. Haslam and R. P. Russell, writing in The Oil and Gas Journal, October 2, 1930, page 218, under the title "Hydrogenation Operation Flexible," state: "Hydrogen may be produced by any of the usual processes. Since the hydrogen need not be sulphur-free, its production from coal or coke by the water gas process is somewhat simpler than when the hydrogen is used for the production of ammonia. Hydrogen may also be produced by liquefaction and distillation of the easily condensable gases from by-product coke ovens, or electrically when the economics permit. For the oil industry, with its generous supply of refinery and natural gas, hydrogen may be made by the treatment of hydrocarbons with steam in accordance with the following equations:

$$CH_4 + H_2O = CO + 3H_2$$
$$CO + H_2O = CO_2 + H_2$$

After scrubbing out the carbon dioxide, the hydrogen is of sufficient purity."

The carbon compounds of petroleum are essentially paraffin hydrocarbons so any compounds of the aromatic series could not be expected to be found in the ordinary petroleum products in any appreciable quantities. When some petroleum stocks are cracked under favorable conditions small quantities of benzol and toluol may be produced. While some conditions of temperature and pressure, with an atmosphere of hydrogen, may increase the yields of these substances, the expense would probably be too high to compete with the coal tar source. Benzol (benzene) is quite easily obtained at a low cost from the dry distillation of coal, that is, in the manufacture of coke, and from the crude benzol it is possible to extract toluol (toluene).

COMPOSITION OF GUM FROM GASOLINE

Can you furnish an analysis showing the composition of the gum from gasoline, Would like to see analysis showing the different elements on a percentage basis?—H. T. N.

All gasolines do not yield the same kind of gum when evaporated so analyses must be classified as to source of the product. Some crude oils yield a gasoline containing large quantities of gum-forming material but others are very nearly free from such material. The cracked gasolines, and especially some of those that have been made by the vapor phase type of operation, may contain very large quantities of gum.

Smith and Cooke, of the United States Bureau of Mines, were among the first to determine the elementary composition of the gum from gasoline and they directed attention to the possible classification of the material. Their original work was reported in Bureau of Mines Reports 2,394 and 2,586, published in 1922 and 1925. A recent investigation has been reported by Wagner and Hyman, American Petroleum Institute, Chicago, December 5, 1929, in which they mentioned the analyses of Smith and Cooke, and included one they had made of a gasoline that had been produced by the vapor phase process. The gasoline examined by Smith and Cooke may have represented a liquid phase product. The table following shows two analyses by Smith and Cooke and one by Wagner and Hyman of the residual gum obtained by evaporating gasoline:

ELEMENTARY COMPOSITION OF GUM	(Per cent by weight)		
	S. and C.		W. and H.
Hydrogen	7.39	6.75	8.00
Carbon	69.48	70.62	73.59
Oxygen	19.93	21.06	17.17
Ash	2.78	1.00	....
Sulphur	0.28	0.50	1.24
Nitrogen	0.14	0.07	....

Quoting from Wagner and Hyman: "These data indicate the general similarity in the composition of residual gum, regardless of source; the empirical formula of the gum would be $(C_5H_5O)_x$. We further found an acid number of about 65 and a saponification value varying from about 250 to above 300, indicating either an ester or lactone structure for the gum. Upon heating over an open flame, residual gum gives off inflammable vapors possessing an odor reminiscent of burning rubber. The odor of the gum when cold is more or less ethereal."

SODA ASH FOR REDUCING CORROSION OF REFINERY EQUIPMENT

I have just read your article in the September 18 issue regarding the use of lime for corrosion in refining. Would like to know if you have ever known anyone who used soda ash instead of lime for the prevention of corrosion in refinery equipment?—J. C. H.

All of the common alkaline substances, ammonia, hydrated lime, caustic soda, and soda ash are being used for reducing corrosion of refinery equipment. These substances, with the exception of hydrated lime and soda ash, are commonly used in the form of a water solution and sometimes ammonia is used in the gas form, that is as anhydrous ammonia. Just what to use and where to use the chemical depends entirely upon the character of the oil and the type of equipment.

There are two forms of corrosion, acid and sulphur, which may be to some extent reduced by the use of alkaline substance. The introduction of any chemical which may concentrate and solidify in a shell still may result in loss through the formation of hot spots. The oils containing chlorides, with the tendency to form hydrochloric acid, may be safely treated with ammonia. Caustic soda, hydrated lime, and soda ash may form solid deposits if there is not adequate velocity to remove all solid material from the heated zone. These chemicals are being used in many plants in the several forms of pipe stills in which the oil is heated while moving at a high velocity.

Soda ash may be injected into the charge in the form of a 10 to 12° Be. solution, the quantity being controlled on a basis of 0.25 to 0.50 per cent of the oil by volume.

There is one danger that should be considered in connection with the use of either caustic soda or soda ash in a still; that is the possibility of caustic embrittlement. Lime does not seem to have caused embrittlement in many stills where it has been used.

Many refiners prefer to pretreat the oil or to confine the use of corrosion correcting chemicals to the condensing systems. The most serious damage to refinery equipment is in many instances confined to the condenser coils. Solutions of caustic soda, soda ash, and ammonia that are introduced before the vapors reach the coils have been found to materially reduce this corrosion.

KEROSENE BURNING TEST

A kerosene testing good in every other respect, gives a poor burning test constantly smoking one side of the chimney after a few hours run. Can you tell us any reason for this poor quality?—J.T.K.

It is presumed that the burning test is being made according to the directions of the American Society for Testing Materials, Committee D-2, A.S.T.M. Standard Method D 187-27, 1927 Book of A.S.T.M. Standards, Pt. 2, p. 364, and adopted by the Government as published in Bureau of Mines Technical Paper 323B, page 73.

Probably there has not been as much said about the burning test as there has been of the other tests for the quality of a kerosene. It may appear to be an easy matter to determine how a sample of oil will burn in a lamp, but, if the details of the testing method are studied, it will be clear that much care must be exercised if the results are to truly represent the burning quality of the oil. It appears that the personal equation is of more influence when making this test than it is for any other of the physical tests in use for the examination of petroleum products. Failure to observe each and every minute detail of the directions may result in a poor test and the possible rejection of an oil that should pass.

The remark "smoking one side of the chimney after a few hours' run" suggests that there has not been proper wick adjustment. Quoting from the directions for making the test: "The trimming should be done very carefully to produce a smooth symmetrical flame free from peaks or ears, and the lamp should be lit and the flame inspected from time to time during the course of the trimming, in order to determine whether the trim is satisfactory. * * * The lamp shall be allowed to burn for one hour and the flame then readjusted, if necessary, to the standard dimensions." Your statement may indicate in addition, that the direction for readjustment at the end of one hour was overlooked.

It is my opinion that if all of the other tests, such as gravity, flash, distillation, sulphur, etc., were made with satisfactory results, the failure of the lamp test was due to the tester and not the product.

The A.S.T.M. report, The Significance of Tests of Petroleum Products, page 32, contains this: "The condition of the chimney at the end of the test is important. Satisfactory oil should not cloud or smoke the chimney, * * *. A black sooty deposit is obviously highly objectionable, but the tester must always assure himself that it is not due to drafts or to improper testing." Also: "While burning tests on illuminating oils cannot be made without experience and strict attention to detail, and while the judgment of the operator plays a greater part in interpretation of the tests than for most tests of other petroleum products, the fact remains that they furnish the only reliable means for the ultimate estimation of the quality of illuminating oils."

DOCTOR SOLUTION

Will you kindly furnish directions for making doctor solution and give the interpretation of the doctor test? What we want to know exactly is how a pure solution should be made for testing gasoline and kerosene and not the common solution for treating?—H. C.

The substances used in the doctor test are sodium hydroxide, litharge, water and flowers of sulphur.

Dissolve 125 grams of sodium hydroxide (sticks) in a liter of distilled water; to the clear solution add 70 grams of litharge. Set this mixture aside, after thorough shaking, for 24 hours. The solution should be shaken occasionally during the first four or five hours and then allowed to settle. At the end of the 24 hours decant off the clear liquid. The clear solution should be kept in a bottle stoppered with a paraffin treated cork.

The test is made by adding about one volume of the doctor solution to three volumes of gasoline and vigorously shaking for about 20 seconds. If there is no reaction, add a pinch of flowers of sulphur and shake again. The test is commonly made in a 4-ounce oil sample bottle, stoppered with a new cork.

A darkening of the gasoline, or the formation of a precipitate at the junction of the two liquids is considered a positive test which is reported as sour. When there is no discoloring of the gasoline and no indication of an orange, brown or black precipitate the test is negative and the product is said to be sweet.

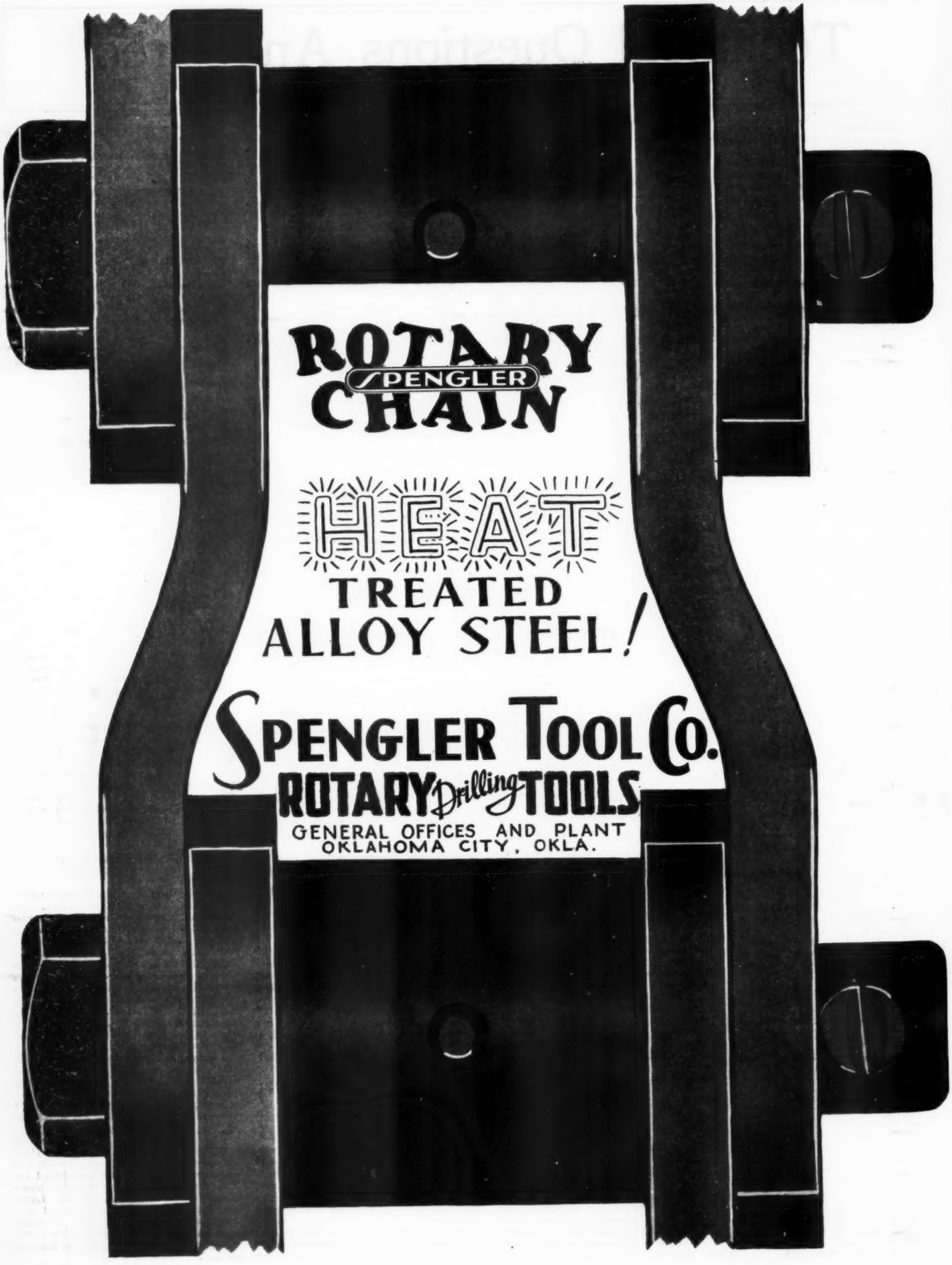
SEDIMENT IN STORAGE AND RECOVERY PROCESS

I desire to ascertain the approximate number of barrels of B. S. (bottom sediment) oil carried in storage by major companies and what process is used in refining same?—M. A. E.

We do not know of any published information showing the quantity of B. S. carried in storage tanks. This no doubt varies to a considerable extent with the pool, field, and district, and is probably larger in the refinery storage of fuel oil than in the tank farms where crude oil is held in storage.

On August 1, 1930, there were 523,885,000 bbls. of crude oil in storage in the United States. Based on the latest figures available for gross and net storage it appears that the difference represents sediment and water equivalent to 6.2 per cent, or 32,490,870 bbls.

The usual methods for the treatment of B. S. and emulsified oil include: Heat treatment; the use of chemicals with and without the aid of heat; centrifugal action in special machines; electrical treatment, usually with the aid of heat. Large quantities of settlings are treated and considerable marketable oil recovered with an additional quantity which is put into a satisfactory condition for burning as fuel.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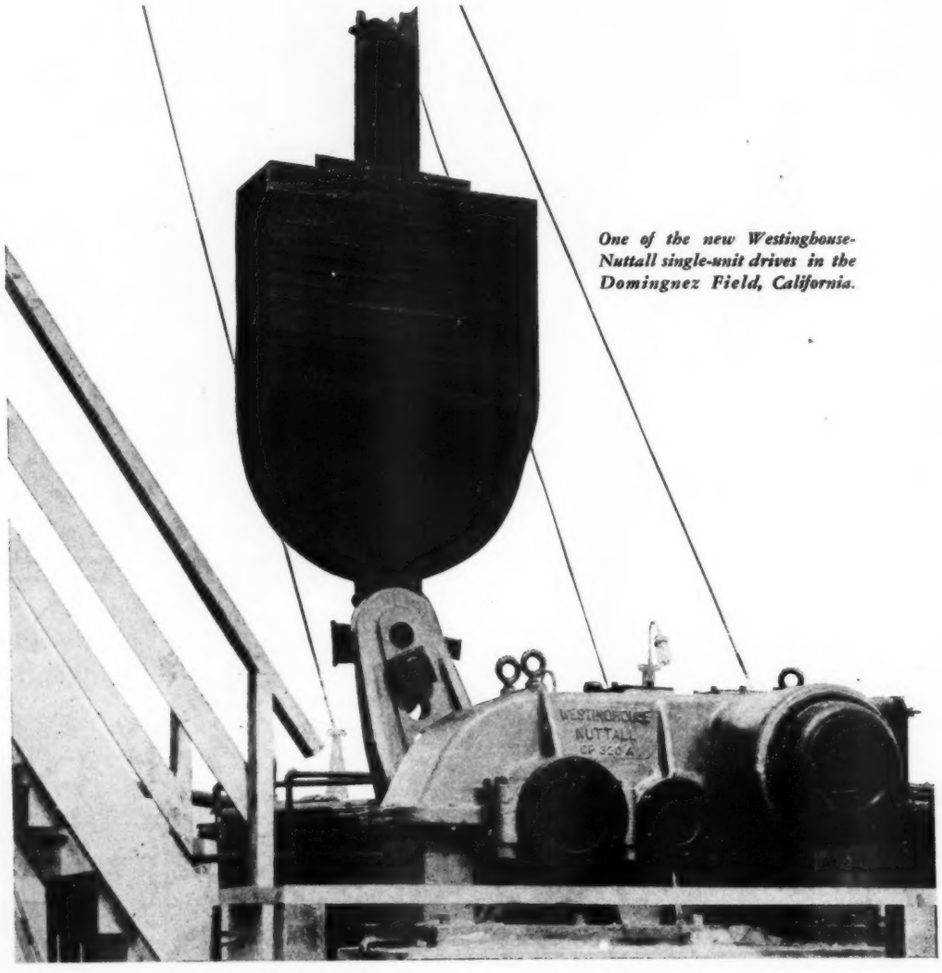
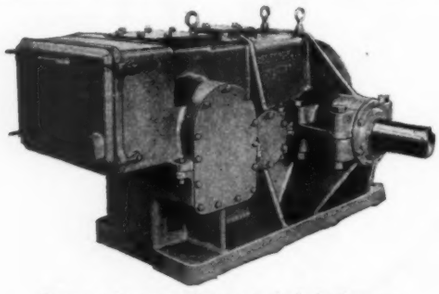
Seen Here and There By The Journal's Cameras

1—V. R. Oakley, superintendent, and E. B. Gray, assistant superintendent, Barnsdall refinery, Barnsdall, Okla. 2—Left to right: Percy Woods, R. Stamey, Frank Crenshaw, geological staff of Humphreys Corp., Barbers Hill Field, and C. C. Bishop, land department, Humphreys Corp., Houston, Tex. 3—David Donoghue, technical advisor, Texas Proration Committee, and L. H. (Shine) Cullum, independent operator, Wichita Falls, Tex. 4—Scott Stephenson, driller, and G. W. Barron tool dresser, Coleman, Tex. 5—A. A. Diehl, attorney, and Ed. Zilkey, field superintendent, Bateman Oil Corp., Fort Worth, Tex. 6—F. J. Smith, superintendent of pipe lines, Texas Pipe Line Co., Electra, Tex. 7—R. D. Cox, Jr., assistant attorney general of Texas, and B. C. Clardy, division manager, crude oil department, Shell Petroleum Corp., Dallas, Tex. 8—L. B. Benton, independent oil operator, Cisco, Tex. 9—Paul Olds, district geologist and W. A. Phelps, office manager, Prairie Oil & Gas Co., Wichita Falls, Tex.

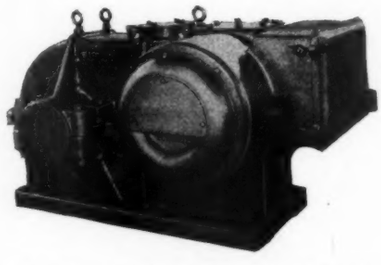
NOW



One of the new Westinghouse-Nuttall single-unit drives in the Domingnez Field, California.



Projected construction at crank shaft gives ample clearance for rotating type counter-balances.



Motor frame and control are part of the top section of the reduction gear.

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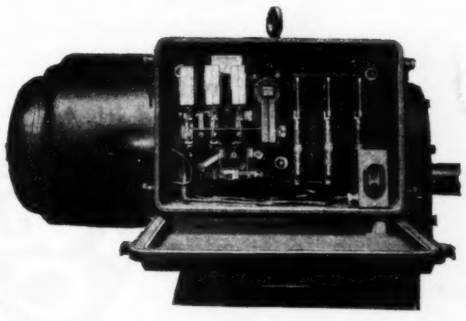
For complete details of this improved drive, write the nearest Oil Well Supply Company or Westinghouse Office for a copy of DMF-5301.



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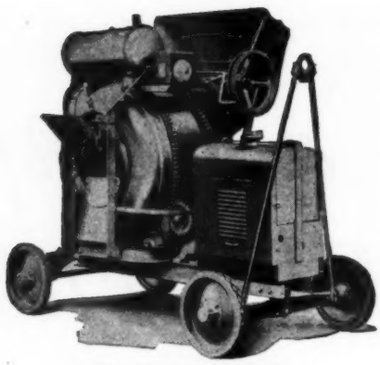

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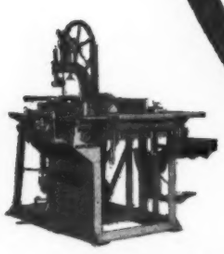

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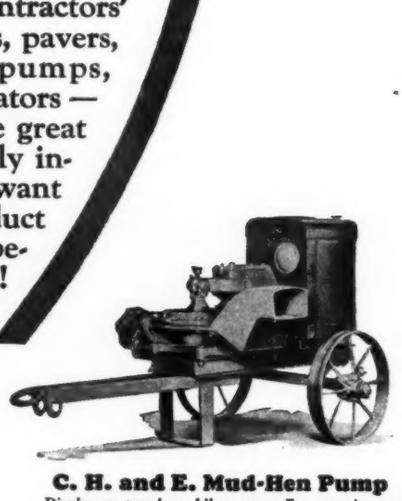

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ROCKY MOUNTAIN AREA

(Continued from Page 56)

hard and tight to 3,183 feet when it began to soften up and showed a little oil and about 250,000 feet of gas per day. It is shut down to run 6¼-inch at 3,155 feet. The 8¼-inch is at 2,240 feet.

Moffat County

Texas Production Co.'s No. 12 Knowlton. SW SE, Section 33-5n-91, Moffet Dome, is bottomed in the Sundance at 4,578 feet and is swabbing and bailing. It was drilled to this depth with a rotary when the rig was destroyed by fire. It is being completed with cable tools and the hole is being swabbed to clean out the mud. Same company's No. 4 Wick. NW NW, Section 10-4n-91, is cementing cave at 4,114 feet. S. H. Keoughan and others' No. 1 State, SW SW. Section 16-4n-101, Midland Ridge or Skull Creek, is bottomed at 2,610 feet and moving in string of 6¼-inch which will be run at this depth. The hole has been caving considerably. Midwest Refining Co.'s No. 24 Hannewait, SE SE, Section 4-6n-92, Bell Rock, is redrilling at 2,958 feet in sandy shale and iron. Old bottom was 3,042 feet.

Petroleum Information, Inc., which has offices in the Continental Oil Building in Denver, has completed a large map of east central and northeastern Colorado showing oil and gas fields, all wildcat drilling wells, dry holes and abandoned wells, pipe lines, refineries, railroads, drainage, etc., on a scale of one-fourth inch to the mile. The area is sectionized and the map is very complete. C. D. Johnson, petroleum geologist, and C. E. Shoenfelt, petroleum engineer, supervised the preparation of the map.

WYOMING

Big Horn County

Ohio Oil Co.'s No. 1 Easton, SW NE, Section 33-56-97, Garland Dome, in Big Horn County, joint with Utah Southern Oil Co., which recently opened a new oil and gas pay in the Madison lime, and which was rated as a 2,500-bbl. well at a total depth of 4,420 feet after being given a short production test, is believed to be a much better well than first reports indicated and parties who witnessed its performance express the opinion that if allowed to produce for 24 hours it probably would have made better than 5,000 bbls. and possibly 8,000 to 10,000 bbls. The well was drilled with a rotary and went more than 600 feet into the pay. The short test showed considerable mud and was cleaning itself rapidly. One report was that during the last 15 minutes of the one-hour test it was flowing at the rate of 260 bbls. an hour. The well was shut in and no further tests of production have been reported. Not only did the well prove the Madison lime for big gas and oil production, but disclosed the thickest pay ever found in Wyoming. This well on the Garland Dome and the company's recent discovery on the adjoining Byron Dome, estimated at 1,000 bbls. in the Tensleep, open immense possibilities for the Big Horn Basin when black oil comes into its own.

Park County

Ohio Oil Co.'s contract for the sale of its Oregon Basin Field crude oil having expired, and no arrangement having been made for its renewal, decision has been made to bring to a halt all pumping operations in the district for an indefinite period. This applies only to that company's operations, as the Texas Production Co., Charles E. Orchard and several other operators are producing their wells, though all of them are not produced at capacity, and the Illinois Pipe Line Co.'s line to Cody will continue to transport the oil. The Texas Company, which operates a refinery at Cody and has been purchasing crude from the Ohio company, has been building up its own production in the field and also had considerable oil in storage. The Ohio company, though a large holder of proven acreage in the field, has done very little drilling the past year on account of the market conditions.

The bids of the Ohio Oil Co. and the Custer Petroleum Co. for leases on government land in the Oregon Basin Field, have been accepted by the Interior Department at Washington and the sale approved. There were three units offered at auction on August 8. Ohio Oil Co.'s bid of $416 an acre, or $83,200 for a lease on the 200 acres in Unit No. 3, was the highest offered. Custer Petroleum's bid was $220 an acre, or $114,400 for the 520 acres in Unit No. 2. There were no bids for Unit No. 1, consisting of 520 acres, due to the necessity of drilling 15 offsets by the successful bidder. The terms of the sale provided that if drilling of offsets was not undertaken within a specified period the successful bidders should pay compensating royalty to the Government and, therefore, the deal does not mean there will be an immediate drilling campaign. The only active operation in Oregon Basin at present is the Texas Production Co.'s No. 2 Sonners, C SW SW, Section 20-51-100, which is rigging up.

Midwest Refining Co.'s No. 31 Frannie Oil, SW cor. NE, Section 25-58-98, Frannie Dome, is bottomed at 3,230 feet in the Madison lime and cleaning out after shooting. No oil appeared and it looks as if the well will be a failure. It is an offset on the east to its No. 36 Rosenberg which made 2,400 bbls. initial from the Madison lime, but which soon developed considerable water. No. 31 was drilled about 200 feet deeper than the offset. Same company's No. 31 Rosenberg, SW cor. SE, Section 24-58-98, is drilling at 2,497 feet in gray shale and drawing close to the top of the Embar. Resolute Oil Co.'s No. 1, SW NE, Section 17-57-101, Badger Basin, is drilling at 7,510 feet and now holds the record for deep drilling in the Rocky Mountain states. Continental Oil Co.'s No. 27 Elk 2, NE NE, Section 24-58-100, Elk Basin, is drilling at 220 feet.

Hot Springs County

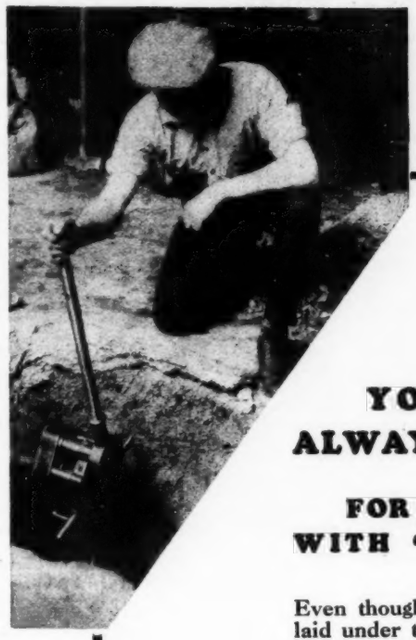
Midwest Refining Co.'s No. 8 Weeks, NW SE, Section 6-44-98, Wagonhound, which gave evidence of opening a new pool when it had good shows of oil in top of the Embar at 3,695 feet, does not look so encouraging. It is drilling at 4,330 feet in black sand and lime and is showing hot sulphur water.

Natrona County

Midwest Oil Co.'s No. 8-SD-3, SE, Section 26-40-79, Salt Creek, which is trying out rotary equipment in the field, is drilling at 1,565 feet in hard shale and lime. Olson Drilling Co., which put down the Midway Dome test, has the contract. Domino-Bessemer Association's No. 5, NE NE, Section 10-39-79, was completed at 2,600 feet in the Second Wall Creek as a 25-bbl. well. It has been standing three years with a string of tools in the hole which could not be recovered. Finally, in co-operation with W. H. Strang, of the United States Geological Survey, another attempt was made and yielded success. Midwest Refining Co.'s No. 11 Middy, NE NE, Section 23-35-79, Midway Dome, is standing cemented. Total depth was 5,215 feet. Hole was cemented back 20 feet to shut off bottom water and will be redrilled to 5,207 feet. As soon as plug is drilled out and new string of special 3-inch seamless tubing is run, the well will be given another test. Cuyler Oil Co.'s No. 1 Ogden, SW, Section 24-36-85, Powder River, is bottomed at 1,250 feet and underreaming to lower casing for a water shutoff. Next objective is the Muddy at 2,200 feet. Roy C. Tarrant and others' No. 1, NE NW, Section 25-31-82, Haygood Ranch, is drilling in the second Wall Creek below 300 feet. It had a show of gas in hard sand at 265 feet. Golden West Oil Co.'s No. 1 State, Section 36-36-81, Segment Basin, is drilling at 750 feet with the Frontier expected at 800 feet. Summitt Oil Co.'s No. 1 Trevett, NW NW, Section 21-33-80, North Platte, is drilling at 650 feet, and Empire State Oil Co.'s No 6., SE cor., Section 12-33-83, Iron Mountain, is drilling at 600 feet.

Converse County

Ohio Oil Co.'s No. 5 Jones, Section 9-33-76, Big Muddy, is bottomed at 3,183 feet where it cemented off the first Wall Creek to drill to deeper horizons, and Continental Oil Co.'s No. 50 Whiteside, SW SW, Section 9-33-76, is standing at 3,304 feet with the Wall Creek cemented off. Weisman Big Muddy Oil Co.'s No. 1, SW SE, Section 6-33-76, is drilling at 2,532 feet. Converse Oil & Gas Co.'s



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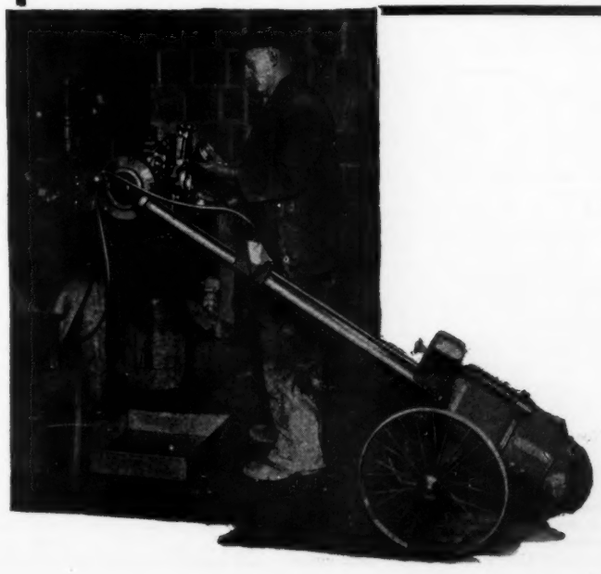


No. 1 Carlson, C SW SW, Section 27-33-73, Alkali Creek, 13 miles west of Douglas, is recementing 12½-inch at 1,087 feet, the first job failing to shut off water.

Niobrara County

Argo Oil Co.'s No. 7 Wehopeso, SW NW, Section 19-39-60, discovery well in Mule Creek, is shut down at 3,170 feet and probably will remain shut in until spring. Ohio Oil Co.'s No. 4 Converse Sheep, SW SE, Section 32-36-65, Lance Creek, is bottomed at 3,612 feet on top of the Sundance and waiting for cement to set. The 8⅝-inch was cemented at this depth. Top of the Sundance showed gas and a test will be made.

Weston County

Two completions were reported in the Osage Field in Weston County. Osage Trust Co.'s No. 7, CNL NW SE, Section 14-46-64, is flowing 400 bbls. per day from sand at 1,634-46 feet, being one of the best recent completions in the Jones Pool, and James McCullough's No. 3 Logan McCullough, NE NE, Section 23-46-64, is making 125 bbls. natural from sand at 1,634-46 feet. Upon the completion of the last named well, this property was taken over by the Wytex Oil Co., of Portland, Ore., under an agreement entered into a month ago. Yellowstone Petroleum Co.'s No. 1 McCullough, NE NW NE, Section 23-46-64, reported a completion last week and extending the productive area a little west, averaged 240 bbls. per day the past week. Pipe line runs and deliveries to refineries in September aggregated 38,500 bbls., compared with 42,886 bbls. in August, 32,500 bbls. in July, 24,500 bbls. in June and 22,530 bbls. in May. Dornacher, Bock and Monahan's No. 1, SE cor. SW, Section 11-46-64, is a location. Lambie Oil Co.'s No. 3 Bock, SW cor. NE, Section 14-46-64, is drilling at 1,400 feet, and its No. 5 Bock, NE SW NE, Section 14, is drilling at 1,400 feet. Decker Oil Co.'s No. 1, NW NE NE, Section 1-45-64, is drilling at 1,500 feet, and Henderson, Garbereck and others' No. 1 Bock, SW cor., Section 2-46-64, is shut down at 1,200 feet. Osage Trust Co.'s No. 8, NW SE, Section 14-46-64, is drilling at 1,200 feet.

Carbon County

Midwest Refining Co.'s No. 27 Union Pacific, NW SE SE, Section 11-20-81, Elk Mountain, is spudding.

Sweetwater County

Mountain Fuel Supply Co.'s No. 2 Union Pacific, Section 15-16-104, South Baxter Basin, was completed in the Frontier at 2,195 feet as a gas well and gauged 3,500,000 feet a day. Same company's No. 1 Union Pacific, NW NE, Section 13-19-104, North Baxter Basin, cemented 6⅝-inch at 3,465 feet, and its No. 1 Cappers, SW NE, Section 2-19-104, is cleaning out at 3,065 feet. Prairie Oil & Gas Co.'s No. 75-A, SW NW, Section 11-26-90, Little Lost Soldier, which tested 1,500 bbls. in the Tensleep when completed last July at 3,962 feet, is being drilled deeper. It is bottomed at 3,988 feet and reaming at 3,978 feet. This was the discovery well in the deeper horizon at Little Lost Soldier.

Fremont County

Kinney-Coastal Oil Co.'s No. 1 Dykeman, SE SW, Section 22-3n-1w, Pilot Butte, the deep test which opened up a new gas field in the Muddy sand, was drilled to 4,635 feet, 135 feet in the Nuggett, without developing anything new of importance. It had a show of gas and dead oil in the top of Nuggett, followed by salt water. It will be plugged back to the Lakota to test a show of oil before going back to the gas horizon.

Texas Production Co.'s No. 1-A State, SW SW, Section 36-34-95, Alkali Butte, will recement 6⅝-inch at 4,485 feet. Big Horn Oil Co.'s No. 1 Gabus, SW, Section 14-38-94, 2 miles northeast of Shoshoni, has derrick up for a deep test. The company has been digging pits to work out the subsurface geology.

Lincoln County

Reeves Aylmore's No. 1 Higgins, NE cor. NW, Section 7-21-119 (O. M. Topley), Sage Dome, is preparing to resume at 1,500 feet after being idle for nearly a year. California capital is reported to have become interested. Wyoming Production Co.'s No. 1 Neill, SE NW, Section 14-24-113, Fontenelle, is drilling at 920 feet and the objective is expected at 1,600 feet. Midwest Refining Co.'s No. 1 Larcher, SE SE, Section 25-37-117, Grays River, is bottomed at 2,720 feet in gray shale and a flow of 3,500 bbls. of water has been shut off. The 6⅝-inch is at 2,475 feet.

MONTANA

The Hannah Porter Oil Co. completed its No. 2 on Iowa Holding Co. acreage in the Border Field last week with a production estimated at about 100 bbls. The well is directly south of No. 1 on the same tract which is still making 100 bbls. a day some months after completion. In the same field Rice Radigan's No. 2 Farbo, drilled in some time ago, was given a shot a week or more ago and was put on the pump. At last report it was making better than 125 bbls. a day. Ohio Oil Co.'s No. 1 Farbo in Section 1-37-4, completed several weeks ago, has been put on production and is making about 50 bbls.

Several completions were reported from the Kevin-Sunburst Field, the best being the Oh Boy No. 3 Stewart in the NE of Section 25-35-3. This well has an initial production of 60 bbls. from the Ellis sand at 1,562 feet. The oil from this particular pool in the Kevin-Sunburst Field tests higher than the normal field production, and as only a few locations have been drilled in this area considerable activity can be expected when general conditions improve. In the same field the Arronow No. 1 Ellingston in Section 14-35-3 found the contact dry and was drilled 20 feet into the Madison lime, encountering a 6-bbl. production. The well was shot but has not since been tested. The Tom Davis Syndicate has a small commercial producer in its No. 13 in Section 10-35-2, finding oil in the Ellis sand. The Northern Natural Gas Development Co. has a good gas well in Section 27-33-2, known as No. 1 Gypsy, which tested 10,900,000 feet. The Rice interests have abandoned No. 16 Bluhm in Section 29-35-1 at 1,530 feet after a shot failed to develop commercial production.

The Sterling Oil Co. has announced the completion of No. 1 Columbia in Section 4-25-1, Bannatyne Field. The well will make about 10 bbls. This leaves one well drilling in the Bannatyne Field.

The Anaconda Petroleum Co. is preparing to resume operations on the Bertholete structure where its test has been standing for several months at 1,635 feet. The well is located in Section 19-36-2, and is thought to be higher on the structure than the Black Gold Petroleum Co.'s well which found production in Section 30.

The Midwest Refining Co. has abandoned No. 36 Scott on the Pendroy or Bynum structure in northern Montana. The well was in Section 2-26-6 and was carried to 2,500 feet. This structure has been tested several times without encountering anything of value.

A report is current in Great Falls that a strike of oil was had in a well in Sanders County, near Thompson Falls. Sanders County lies on the western boundary of Montana, just south of Lincoln County, Lincoln County being the northwest county of the State. The mountainous topography of Sanders County has been considered sufficient to obviate any chance of finding petroleum there.

The Montana division of the Independent Petroleum Association of America will meet in Great Falls on October 18 to effect a permanent organization. The Montana division is headed by William Fulton, operator and producer in the Montana fields.

Pipe Line Runs

Daily average pipe line runs from the various pools for the week ending October 11 follow:

WYOMING	
Salt Creek	25,830
Frannie	100
Big Muddy	1,940
Oregon Basin	2,500
Dutton	150
Elk Basin	870
Byron	550
Warm Springs	100
Lovell	....
Ferris	40
Grass Creek	2,110
Hamilton	870
LaBarge	1,520
Lance Creek	120
Lost Soldier	5,770
Osage	1,470
Poison Spider	400
Rock River	2,110
Simpson Ridge	50
Teapot Dome	40
Dallas-Derby	330
Hudson	270
South Casper Creek	....
Pilot Butte	....
Total	47,140
MONTANA	
Cat Creek	1,130
Kevin-Sunburst	6,080
Pondera	1,690
Lake Basin	80
Border	560
Total	9,510
COLORADO	
Moffat	1,952
Fort Collins	1,170
Florence	436
Iles	1,082
Tow Creek	364
Boulder	25
Rangley	50
Total	4,179
NEW MEXICO	
Hogback	400
Rattlesnake	1,290
Table Mesa	90
Artesia	725
Cap Rock (Mallamar)	388
Jal	1,343
Hobbs High	29,586
Lea City	4,850
Miscellaneous (Lea County)	1,310
Getty	109
Total	40,091
Grand total	100,950
Previous week	113,719
Difference	12,769

UNIT PLAN PROPOSAL AT KETTLEMAN HILLS

(Continued from Page 63)

tions for the operation of plans and facilities.

The by-laws are subject to repeal and amendment at any annual meeting, or at any meeting of the members called for that purpose, by three-fourths of the votes of all members of the association.

Co-operative Plan for North Dome

"The Co-operative Plan" as outlined provided for an unincorporated organization, to be administered by a manager and an engineering advisory board elected by members of the organization, the organization to be effective until January, 1933. Under this plan the field would be divided into three zones for the purpose of determining and compensating nonproducing leases for drainage. The chief criticism of the co-operative plan was the failure, in the past, of the operators who were parties to agreements of that type to carry out the intent of the agreements.

Probable Results

In its report on the unit operation plan the engineering committee sets forth some interesting facts as to the probable results of restricted development and production of oil and gas in the Kettleman Hills North Dome Field during the present period of overproduction in the oil industry. According to this report the allowable average daily production of Kettleman crude oil for the years 1930, 1931 and 1932 is 13,700 bbls., 28,000 bbls. and 39,400 bbls., respectively. These figures are based on estimates by the California Operators' General Committee of the requirements of the California oil industry. In order to supply the daily oil production for the years 1930, 1931 and 1932, the estimated daily gas production is 342,500,000 feet, 560,000,000 feet and 788,000,000 feet, respectively.

The estimated average daily shipments of gas to the utility companies will be approximately 90,000,000 feet for the remainder of 1930. The demand in 1931 is estimated at 240,000,000 feet per day; in 1932, at 290,000,000 per day. During July, 1930, the average daily gas production for the field was 455,000,000 feet; the sales, 89,267,000 feet; lease and plant fuel, 28,026,000 feet, and waste, 337,688,000 feet. The gas production is now larger.

Should the State law to prevent wastage of gas be declared constitutional, and the Kettleman Hills operators be required to cut the wastage in accordance with the rulings in the Ventura oil field, the allowable wastage would be 10 per cent over the working surplus. Under such a schedule the daily gas production for the Kettleman Hills would be reduced as follows:

1930	1931	1932
feet	feet	feet
342,500,000	560,000,000	788,000,000
by	by	by
77,500,000	182,000,000	357,000,000
to	to	to
265,000,000	378,000,000	431,000,000

Under such a schedule the allowable daily oil production would be: 1930, 10,600 bbls.; 1931, 18,900 bbls.; 1932, 21,500 bbls. These figures are based on a ratio of 25,000 feet of gas to the barrel of oil for 1930 and 20,000 feet to the barrel for 1931 and 1932. The wells now producing show a minimum of 26,000 feet to the barrel, and the oldest producer in the field shows a ratio of 43,000 feet to the barrel. The present average ratio of the seven producing wells is 33,000 feet to the barrel.

Production During Life of Field

A summary of the production of the Kettleman Hills Field from the date of discovery to June 30, 1930, is as follows:

	Oil, bbl.	Gasoline. gal.	Gas. ft.
Gov't lands	3,634,697	81,757,503	86,341,733,000
Patented lands	1,317,222	37,130,000	36,299,328,000
Total	4,951,919	118,887,503	122,641,061,000

In addition it is estimated that 271,300 bbls. of oil and 33,607,000 gallons of gasoline have been wasted owing to wells being out of control, and that 93,524,720,000 feet of gas has been wasted owing in part to the same cause and in part to lack of a market. The daily gas wastage in July was 337,688,000 feet.

Up to September 1, 1930, there had been drilled to completion and placed on production seven wells, with a daily production of 14,862 bbls. of oil, 491,700,000 feet of gas and 578,535 gallons of gasoline. In addition, 24 wells have been completed and suspended. If the suspended wells were put on production and produced at the present rate of the seven wells now producing, the approximate total daily output would be more than 67,000 bbls. of oil, 2,500,000 gallons of gasoline and 2,000,000,000 feet of gas.

The productive formation is known as the Temblor sand and is encountered at depths ranging from 6,100 to 7,600 feet, depending on the location on the structure. The greatest penetration of the oil sand is 1,400 feet. In the sand three zones are recognized: (1) the first 300 feet, with a low gas volume and flowing pressure and with fine grained sand of 11 per cent porosity; (2) the second zone, extending from 300 to 1,000 feet below the top of the sand, with high gas volume and high flow pressure, containing coarse grained sand of 17.8 per cent porosity; (3) the third zone, below 1,000 feet from the top of the sand, possibly to be known as the dark oil zone, from which black oil of 45 degrees gravity has been obtained.

Curtailed Agreement in Effect

The Secretary of the Interior and the director of the Geological Survey were instrumental in having the curtailment agreement put into effect, with the purpose of enabling the permittees to perfect their titles and of protecting the public from enormous wastage from this great resource of gas and oil. The Secretary has now succeeded in obtaining the needed amendments to Sections 17 and 27 of the general leasing act of February 25, 1920. On July 3, 1930, Section 17 of the act was amended to read in part as follows:

"* * * Provided, that any lease heretofore or hereafter issued under this act that has become the subject of co-operative or unit plan of development or operation of a single oil or gas pool, which plan has the approval of the Secretary of the Interior as necessary or convenient in the public interest, shall continue in force beyond said period of 20 years until the termination of such plan; and provided further, that the Secretary of the Interior shall report all leases so continued to Congress at the beginning of its next regular session after the date of such continuance."

On the same date Section 27 was amended to read in part as follows:

"* * * And provided further, that for the purpose of more properly conserving the natural resources of any single oil

or gas pool or field, permittees and lessees thereof and their representatives may unite with each other or jointly or separately with others in collectively adopting and operating under a co-operative or unit plan of development or operation of said pool or field, whenever determined and certified by the Secretary of the Interior to be necessary or advisable in the public interest, and the Secretary of the Interior is thereunto authorized in his discretion, with the consent of the holders of leases involved, to establish, alter, change, or revoke drilling, producing, and royalty requirements of such leases, and to make such regulations with reference to such leases with like consent on the part of the lessee or lessees in connection with the institution and operation of any such co-operative or unit plan as he may deem necessary or proper to secure the proper protection of such public interest; and provided further, that except as herein provided, if any of the lands or deposits leased under the provisions of this act shall be subleased, trusteed, possessed, or controlled by any device permanently, temporarily, directly, indirectly, tacitly, or in any manner whatsoever, so that they form a part of, or are in anywise controlled by any combination in the form of an unlawful trust, with consent of lessee, or form the subject of any contract or conspiracy in restrain of trade in the mining or selling of coal, phosphate, oil, oil shale, gas, or sodium entered into by the lessee, or any agreement or understanding, written, verbal, or otherwise to which such lessee shall be a party, of which his or its output is to be or become the subject, to control the price or prices thereof or of any holding of such lands by any individual, partnership, association, corporation, or control, in excess of the amounts of lands provided in this act, the lease thereof shall be forfeited by appropriate court proceedings."

The amendments as passed are available only until January 31, 1931, a fact that will necessitate the prompt preparation of a plan satisfactory to all interested if the Government is to become a party thereto prior to the date of expiration.

The potentialities of the Kettleman Hills Field as a source of gas and oil are so enormous that a unit plan of operation seems the only logical and economical plan under which further operations can be carried on without breaking the back of the overburdened oil market of California and involving an unprecedented waste of gas, an available and adequate supply of which means so much to the future of the State.

NEW LIGHT THROWN ON COASTAL DOMES

(Continued from Page 31)

Mills Bennett Production Co. already has taken the lead in basing its development program at Allen Dome in Brazoria County on that theory. That the top of Allen Dome at least on the southeast side is a protruding ledge of salt is virtually proved by Mills Bennett's No. 1 Poole which drilled through 736 feet of cap rock at 1,530-2,086 feet and was completed as a 1,600-bbl. well in an oil sand at 4,348-74 feet.

As shown by an accompanying map of the Allen Dome, this well was located purposely within the limits of the cap rock area contour proved by earlier drilling development of the dome in which a series of shallow tests had been drilled to the cap rock which ranges from 900 to 1,500 feet.

This earlier development had been by Shell Petroleum Corp., which discovered the dome geophysically during 1925. Following the series of tests scattered over the top of the cap rock area which failed to prove any production, Shell drilled a series of deep flank tests away from the outlined cap rock area on the northeast, east and south sides of the dome. This deep sand development resulted in numerous important showings of oil and gas and the completion of two producing wells. The latter, however, failed to hold up although one, No. 1 Allen, still is pumping around 18 bbls. daily.

As a whole, though, this work was disappointing and during the latter part of 1929, Shell Petroleum Corp., turned over a half interest in the dome to Mills Bennett Production Co. for the drilling of two deep tests, the latter company to do the development. Since, however, in a deal completed, earlier this year, Mills Bennett acquired Shell's remaining half interest on the dome except on the Random tract on the southeast side and in the San Bernard River bed rights, which extended across the eastern side of the dome.

Tests on Allen Dome

Mills Bennett's first test, No. 1 Allen, drilled in partnership with Shell Petroleum Corp., was located on the southeast flank of the dome off the cap rock area and approximately 200 feet from Shell's No. 1 Allen. That well was completed as a 700-bbl. well from sand at 4,868-4,998 feet. Although it held up a little longer than previous Allen wells, it also went off soon, and was put on the pump, but still is making around 20 bbls. daily. The second test, No. 1 Random, drilled by Mills Bennett also was located away from the outlined dome. This test encountered strong gas pressures at a total depth of 5,363 feet which so far have prevented completion.

At this time, however, discoveries which had been made at Barbers Hill and exploration there in which this company had pioneered led Mills Bennett Production Co. to the belief that the top of Allen also protruded from a central salt plug similar to that at the former dome and that deep development out from this cap rock area probably had been a little too far away from the main salt mass. This was evidenced in the fact the development failed to materialize into anything of importance although every indication had been given of some nearby prolific source of oil and gas.

Thus, in the belief that the Allen cap rock area might be a false top overlying the real oil reservoir, this company made location for No. 1 Poole up on the cap rock. What was done has been told, the result being the largest well yet completed at Allen.

As in tests on the extreme north end of the Barbers Hill cap rock area, the Poole well drilled directly from cap into formation without the usual underlying salt. On the assumption that this cap rock also is a ledge protruding from the shelf of salt even that well is located a little too far out and a closer-in test to pass through the possible salt ledge, will have to be drilled to tap the main source of production. That the next new location at Allen will be made with this in mind, has been indicated.

Old Ideas Questioned

Of considerable importance in connection with this recent exploration at Barbers Hill is the fact that operators there have tended to disprove the belief that salt presents a barrier to drilling hard to overcome. It has always been thought that rapid crystallation of drill stem would make impossible the drilling of great depths into rock salt. Operators at Barbers Hill so far have experienced very little difficulty and in one test, Mills Bennett Production Co.'s No. 3 Barber, 1,646 feet of salt was penetrated successfully. The secret of drilling through salt, according to these operators, is in the drilling fluid which must be of a consistency just below the saturation point, thin enough, but not too light, to permit the ready solution and flow of the salt drilled from the hole. That the chief problem lies in preventing the salt from solidifying around the drill stem after being taken into solution has been found, thus the fluid has to be fresh and sufficiently light to maintain the constant flow and prevent any accumulation higher up in the hole.

CALIFORNIA GASOLINE QUOTATIONS UNSETTLED

LOS ANGELES, Calif., Oct. 13.—Gasoline prices on the Pacific Coast remained unsettled during the past week and although no further weakness was in evidence a larger volume of cut rate gasoline found a ready market in the retail trade at from 2 cents to 7 cents per gallon below the regular posted price in southern California territory. At other points along the Pacific Coast the tendency to reduce prices was not conspicuous although at several points up through the San Joaquin Valley and in the San Francisco Bay region natural gasoline from Kettleman Hills blended with straightrun gasoline is being sold in the retail trade considerably below the official posted price.

A considerable quantity of Playa Del Rey crude oil has been dumped on the market during the past 10 days and if this policy continues it may ultimately be reflected in lower prices for gasoline. Some refiners can handle this crude very nicely but in certain types of equipment it has been found undesirable because of corrosion. If it was not for the high sulphur content of Playa Del Rey crude oil production of this field would prove a very disturbing factor. Few of the major companies care to handle this oil because of its corrosive tendencies. The Del Rey Oil & Refining Co. has been purchasing the bulk of crude oil production at Playa Del Rey and this company in turn has been disposing of its purchases principally to the Shell Oil Co. The Union Oil Co. and the United States Refining Co. are also purchasing limited quantities in the field.

Gasoline consumption on the Pacific Coast has begun to fall off due to the usual seasonal tendency and this has been reflected in a much more pronounced competitive condition. The Union Oil Co. came out with a new winter gasoline a week or so ago and other marketers are expected to put their winter grade on the market shortly. The large amount of natural gasoline available for blending purposes and the usual custom of blending more natural gasoline during the winter months has resulted in a larger demand for 60-62 400 endpoint gasoline with the result that the price of the latter has taken on a firmer tone during the past few months.

WINNERS IN PETROLEUM SAFETY CONTEST

Representatives of companies winning awards in the 1930 petroleum section safety contest at the recent annual safety congress in Pittsburgh.

Front row (left to right): L. A. Brower, Gulf Pipe Line Co., Lufkin, Tex.; O. O. Perry, Hope Construction & Refining Co., Clarksburg, W. Va.; T. N. Shaw, Midwest Refining Co., Midwest, Wyo.; B. V. Osborn, Standard Oil Co. (Indiana), Casper, Wyo.; J. S. Hunter, Atlantic Refining Co., Philadelphia, Pa.; G. L. Farned, Humble Oil & Refining Co., Ingleside, Tex.; W. C. Lynch, General Petroleum Corp. of California, Los Angeles, Calif., and J. P. Sutton, Ohio Oil Co., Findlay, Ohio.

Back row (left to right): G. W. Bell, Ohio Oil Co., Casey, Ill.; R. B. Roaper, Humble Oil & Refining Co., Houston, Tex.; H. D. Kettell, Standard Oil Co. of New Jersey, Baltimore, Md.; R. W. Black, Standard Oil Co. of New Jersey, Elizabeth, N. J.; E. R. Alden, Vacuum Oil Co., New York City; I. W. Lobb, Vacuum Oil Co., Bayonne, N. J.; R. C. Byars, Shell Petroleum Corp., St. Louis, Mo.; J. L. Matteson, The Texas Company, Port Arthur, Tex.; Charles H. Linberg, Conewango Refining Co., Warren, Pa.; L. W. Dawson, Shell Petroleum Corp., Sellers, La., and R. E. Donovan, Standard Oil Co. of California, San Francisco, Calif.

NO BAN ON HELIUM EXPORT

WASHINGTON, D. C., Oct. 13.—President Hoover says the Government is encouraging the exportation of helium gas for lighter-than-air craft rather than hampering it. The law provides licenses may be issued for exporting at any time by the Government. In the past two years every application for exporting licenses has been granted.

MUHLENBERG MAP

State Geologist W. R. Jillson announces that the Kentucky Geological Survey has a new oil and gas geological map of Muhlenberg County, Kentucky. The price is $1.

VETERANS OF PETROLEUM INDUSTRY HONOR PITTSBURGHER AND TULSAN

One of the features each year of the International Petroleum Exposition held in Tulsa is the gathering of the "Old Timers" of the industry. This year this event was bigger and better than ever. The veterans met at the exposition on October 8 and selected from their number the Grand Old Man of the Oil Industry and the Grand Old Man of Tulsa. E. H. Sloan and J. J. Larkin were chosen for these respective honors.

Mr. Sloan was born on the banks of the Allegheny River near Franklin, Pa., on December 17, 1845, which makes him 85 years of age his next birthday. He visited the Drake well when he was 14 years old and two years later began his oil field work, which continued for a period of 68 years, or until two years ago, when he finished his last job of rig work by taking down two old derricks in a Pennsylvania field.

Mr. Sloan has two sons who are both in the oil business. One, William E. Sloan, lives at Chelsea, Okla., and works for the Carter Oil Co., and the other, J. G. Sloan, is in the contracting business in Tulsa.

Mr. Sloan began his career in the oil fields as helper on a drilling well in the Petrolia, Pa., field in 1868 and continued at this work until 1872, when he started rig building, which he followed for 30 years afterward. He has also spent much of his time in shooting wells in fields in Pennsylvania and West Virginia and has always lived in the East during his active working days.

When he started building rigs, Mr. Sloan said, they were mostly 84 feet high and made out of white oak in West Virginia and hemlock in Pennsylvania, those woods being native of each State where used. At times he has gone into the the woods adjacent to the well and cut his tree and trimmed it for a walking beam or sampson post or main sill as occasion required.

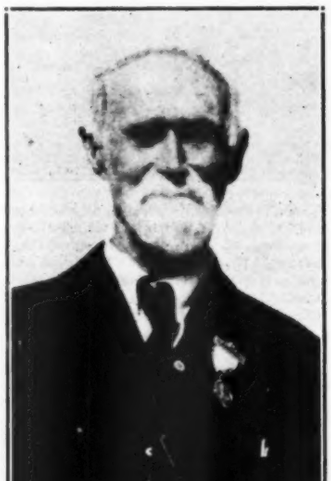
Rig irons were 3½-inch size when he started this work and later they were made very heavy, the shaft size being increased to 4-inch. Now the 4½-inch iron is still used in a few fields in West Virginia and Pennsylvania.

Speaking of the present condition of overproduction, Mr. Sloan said that he well remembers the time in Oil City when oil could be had at the wells for 10 cents per barrel if the buyer took his barrels to the well and filled them himself. He has also seen oil at $5 per barrel that was handled down the river in what they called "bulk boats" made in the oil fields out of lumber and caulked. These scows were about 20 feet wide and 140 feet long and held approximately 1,500 bbls. of oil and two were usually lashed together and floated down the river to Pittsburgh, where the cargo was pumped out and sold.

"Moonlighting"

In the old days while the Roberts' patent for exploding nitroglycerin under a fluid was in effect it was common practice for the owner of a well to make a bargain with a shooter to pay with the first day's production out of the well for the shooting.

With oil at $5 per barrel and the wells making upward of 150 bbls. per day this



E. H. Sloan

practice soon lost favor with the operators and they took other means of getting their wells shot.

The new practice was known as "moonlighting," but in actual practice the darker the night the better the operators liked it. A shooter, who could buy nitro as he wanted it, but could not put it in a well without paying royalty to Roberts, would go out at night and place the main part of a shot in the well and then next day would go to an authorized shooter working under the Roberts' patent for a few quarts of glycerin to top the shot and explode the main charge.

This small amount of nitroglycerin and the privilege to shoot cost about $50, whereas the shooting of the well under Roberts' patent would cost upward of $750, so the practice of "moonlighting" grew and flourished even though it was quite dangerous because of the conditions under which the fluid was handled.

Mr. Sloan was in California last year looking over the fields there and is now

J. J. Larkin

living with his sons in Tulsa and Chelsea.

J. J. Larkin, who was elected the Grand Old Man of Tulsa, is a well-known business man of that city and a director in the Exchange National Bank and president of the Larkin Torpedo Co. He organized the Eastern Torpedo Co. and sold it and later organized his present company.

Mr. Larkin has been actively engaged in the oil industry for 52 years and started work at the age of 16 years.

MUD PROBLEM NOW RECEIVING ATTENTION

(Continued from Page 32)

cleaning mud by the use of vibrating screens and the Link-Belt Co. has stationed a man at that point who has been kept busy working out the details of the driller's problems.

Already seven screens have been installed by the Amerada Petroleum Corp., Humble Oil & Refining Co., Sun Oil Co., and the California Co., and others are to be installed and the Noble Drilling Co., of Tulsa, has been quick to recognize the advantages of screening and has purchased a screen to be installed at the Oklahoma City Pool immediately.

It is stated that one of these screens paid for itself in saving of mud and removing cuttings at a time when the well needed mud badly within five hours of the time it was installed, and to date has reclaimed over $10,000 worth of mud for this company.

The screens there are used for two purposes, one to remove cuttings from the mud as it came from the well and prepare it for immediate return to the hole. This saves wear in the slush pump valves and also will remove gas from "gas-cut" mud and restores weight to the mud that comes from the hole charged with as high as 55 per cent gas, 2 per cent oil and only 43 per cent mud.

The other process is to reclaim mud from one well to be reused in other wells as they are drilled and the Humble Oil & Refining Co. have used the mud from its first well in two other wells at a very material saving in drilling cost for mud mixtures.

Vibrating screens handle about 900 gallons of mud per minute in the drilling of the upper part of the hole at the Hobbs Field, this mud weighing about 9 pounds per gallon. This is equal to over 240 tons of material per hour which is good screening capacity in any industry.

As the wells are deepened the weight of the mud is increased up to about 14 pounds per gallon maximum and then the screens only handle about 600 gallons per minute, but this is maintaining tonnage, for under these later conditions they are handling about 250 tons per hour.

The power required to drive the screens is secured from a steam turbine made by the Robinson Manufacturing Co. of Chicago, Ill., by taking the steam side of a Pyle rig lighter. Power is transmitted to the drive shaft of the vibrator screen by use of "V" belts.

This turbine develops a starting torque of about 1½ horsepower and generates about .97 horsepower for running conditions. The screen speed is 1,800 r.p.m.

The floor of the derrick is about 6 feet above the ground and in the Hobbs N. Mex. Field the surface of the ground is practically level, so a shallow pit about 2 feet deep is dug to one side of the rig and the screen set over it. This gives a fall of about 6 inches to the mud ditch from its head under the derrick floor to the inlet on the screen, a distance of about 12 feet.

The intake apron on the vibrating screen is about 42 inches above ground level, and the screen has been tested at angles varying from 11° to 27° from the horizontal. The proper angle for the screen will vary and depends upon the work to be done, but as it is easy to

Veterans of the petroleum industry in session at seventh International Petroleum Exposition and Congress, Tulsa

establish this desired angle by a little experimenting at the individual well where it is installed this is not presenting a difficult problem.

Slush Pits Reduced in Size

In the Oklahoma City Field it has been stated that the average cost of slush pits was about $750 per well, and as there are nearly 800 wells drilled in that pool this would represent an investment of about $600,000, and because of conditions there these pits were not used after the well was completed and it is possible that where they have been dug upon land that is valuable for farming or other purposes it is going to be necessary to clean them up and thus add to the expense.

In Hobbs they have found that they can get along with one small slush pit, about 12'x14'x20' size, into which the mud that has passed through the screen is delivered and from which the suction of the slush pumps picks up the treated mud to return it to the well.

In Hobbs there is a caliche stratum that is close to the surface and varies all the way from a few inches to several feet in thickness and is more or less porous. It has been necessary to line some pits with cement and others have made their own sealing by settlings from the mud passed through them. Either method of lining costs about $50 per pit.

As these pits must be blasted out of this hard rock any reduction in size is of advantage and lowers the cost of the well. It is therefore desirable for the operators in Hobbs Field, or in other areas, for that matter, to hold the size of the slush pits to a minimum.

Where the vibrating screens are used in Hobbs Field the slush pits are notable for their small size and this saving is being credited to the screen plant installation.

In the testing work in Hobbs Field the engineers have experimented with three sizes of screen; 30 mesh, 31-pound wire; 24 mesh, 26-pound wire, and 30 mesh, 34-pound wire, all having approximately the same size openings, and they find that they are removing practically all of the cuttings as they come from the well.

These cuttings are run into a 6'x6'x6' pit at the lower end of the screen and from there jetted into a storage pit away from the well. They could be delivered immediately into truck or loading bin and used for road making if so desired. The mud that accompanies the cuttings is negligible in amount, and water must be added to the pit from time to time to permit the steam jetting device to pick up the cuttings and deliver them to the storage pit.

To sum up, the screen plants have saved mud, slush pit cost, wear and tear on pumps and shortened drilling time as well as aereated the gas cut as it came from the well.

Re-using mud after it has been used in drilling a well is practicable, and it is predicted that it will be common practice in the future and by following the suggestions contained in Mr. Parson's paper it is going to be possible to re-process mud so that even the mud made from the formations penetrated in drilling the well will be kept in the best possible condition.

Removing 30-Mesh Cuttings

When the cuttings are finer than 30 or 40 mesh it is difficult to remove all of them from the mud by screening, although screens as fine as 50 and 60-mesh have been used in California mud plants in re-circulating muds, and it will be necessary, therefore, to go to other mechanical methods to take out this very fine material from processed mud.

This is simply following the evolution that was experienced in ore dressing mills. There they first used screens, then they used screens and classifiers, and later added thickeners and other equipment to the system until finally they have come to a point where they have developed apparatus that will perform any of the operations required to process the ore for separation of mineral and gangue.

This will be the method of procedure followed by the petroleum industry and it can draw heavily upon the engineers and manufacturers who are serving the mining and other industries for advice, and as the chemistry of mud is developed take from the other industries equipment that will handle the mud to give the results recommended by the technical engineer.

The Dorr Co. of New York City is so well known to the industrial world that it hardly seems necessary to introduce it to the petroleum industry. As a matter of fact, it is quite well known to the engineers of the refining departments and has contributed some valuable assistance in working out equipment used in the Goodwin process and other processes used in the refinery.

In this issue there is an article prepared especially for The Oil & Gas Journal by G. L. Benjamin, engineer for the Dorr Co. in Los Angeles, Calif., who has been actively engaged in working out the details of the plant installed by the Associated Oil Co. at Ventura Avenue Field, California, and in this article he describes the process followed there, and thus contributes much authentic data to the petroleum industry covering this mud problem.

It is predicted that the petroleum industry will adopt classifiers and thickeners and other equipment used in other industries to its mud problems in the near future, for as Hallan N. Marsh points out in his paper printed in this issue of The Oil and Gas Journal, processed mud is being used with such success in the California fields that they cannot afford to be without it. The drillers have become accustomed to using prepared mud and now are asking for it and state that where it is available they can drill their wells with the feeling that the drill stem will not be stuck in the hole when circulation is lost for any reason. And anyone familiar with the California fields knows that many wells there have been finished just where the drill stem was stuck and later produced through the hole in the drill pipe rather than drilled to the formation desired.

Centrifugal machines have always interested the engineers, and it is not surprising to learn that the Union Oil Co. is experimenting with a special centrifuge that is designed to remove cuttings from rotary mud, and has given good service thus far. It is fully described and illustrated in L. P. Stockman's article appearing in this issue.

More Work Necessary

While the bibliography of articles on mud-laden fluids used in rotary drilling is quite long and contains the names of many interesting articles indicating what has been done thus far, it is predicted that within the next year greater progress will be made in solving this problem and like the crooked hole problem of two years ago it will be quickly conquered, and to this end The Oil and Gas Journal is lending its support, for it is fully realized that any reduction in cost of drilling wells is a direct gain to all departments in the industry, and to the consumers of petroleum products.

It is hoped that the United States Bureau of Mines can combine the valuable work done by that department working on ore dressing and flotation problems with the practical work done in rotary drilling and production problems done by the petroleum division so that the petroleum industry can have the benefit of all this research. As the experimental stations at Rolla, Mo., and Bartlesville, Okla., are not far apart and the engineers who have been actively engaged in the work of the two divisions are stationed there it should not be difficult to bring them together to the advantage of all concerned.

The manufacturers of admixtures for mud fluids are doing their share to aid the driller in solving his mud problems, and much has been learned of the qualities of these various clays and minerals, and it is no longer necessary for the driller to accept anything that happens to be handy and add it to his mud, if he will only take advantage of the data available that is prepared by these companies, and at the same time outline his drilling campaign with as much care so far as mud mixtures are concerned as he does in selecting his drilling equipment.

There are a lot of materials offered that have not been fully tested, and it is only fair to those manufacturers who are spending money to learn definitely what their materials will do that they be given the support of the industry. This does not limit the field, but it will raise it to a higher standard and make it possible for the customers to know what they are buying and secure services of experienced men to assist them in using the admixture properly.

When the crooked hole problem was at its height it attracted the attention of many engineers, and as a result, they have developed numerous devices for surveying holes, and no company need be without a good surveying instrument at this time.

With the mud problem receiving consideration now, it is predicted that engineers will again develop equipment and methods for handling mud that will give desired results, but it is suggested that before inventors start to develop entirely new (?) machines that they have patent office search made to learn if their idea is as new as they think it is, for with all of the experience manufacturers of this type of equipment for other industries have had, it seems that the petroleum industry is very fortunate it can draw upon that experience and apply it to good advantage and at low cost to its own problems in mud handling.

It is proposed to print in The Oil and Gas Journal articles on this subject as they are available, and in this way build up the literature on mud handling and assist those interested as much as possible.

Many Accessories Used

As it was when the work upon crooked holes was most active, many different devices are now being developed by men who are working with mud problems. They have developed mud weighing machines, hydrometers, viscosimeters, and mixers that can be used at the well by the driller.

One piece of apparatus that is being quite favorably received by the operators in California, New Mexico, Texas and Oklahoma is the Martin-Decker automatic recording mud scales which gives the driller a continuous visual record of his mud weight and prepares a permanent record for the office at the same time.

The old type of gallon can and spring scale are rapidly going out of use and hydrometers that weigh the mud accurately, as well as viscosimeters of the type described in Mr. Marsh's paper, are rapidly coming into use.

To properly mix admixtures into mud fluid several different devices have been designed and are finding a practical use at the well. Some work upon the principal of mixing paddles in a vessel, while others depend upon the jetting action of a stream of water or steam under high velocity passing across the apex of an inverted cone, into which the dry admixing material has been dumped.

ROYALTY OWNERS MEET

The third annual meeting of the Mid-Continent Royalty Owners Association was held October 9 in Tulsa. Directors for the coming year were elected and addresses were made by different members of the association. The association adopted a code of ethics. The president selected William Meazels as chairman of the nominating committee, other members being A. W. Dustin and P. N. Wiggins, Jr. The committee selected the following as directors for the coming year: J. Monte Hayner, Willard Foster, F. H. Greer, A. W. Dustin, W. E. Brown, Carl R. Blackman, Wade H. James, Olney F. Flynn, J. R. Simpson, Earl Sneed, P. N. Wiggins, Jr., G. H. Woodward and F. T. Hilt, all of Tulsa; E. P. Jones and Harlin Reed of Okmulgee; W. E. Harber, Seminole; F. H. Reed, Neosho, Mo.; J. Edward Jones, New York; Frank Buttram, Irving Perrine and Dean Stacy, of Oklahoma City; Charles Roberts, Winfield, Kans.; and S. S. Orwig, Wewoka, Okla. The directors will meet later and elect one of their number as president.

INTRODUCING NEW TYPE VAPOR PHASE UNIT

(Continued from Page 38)

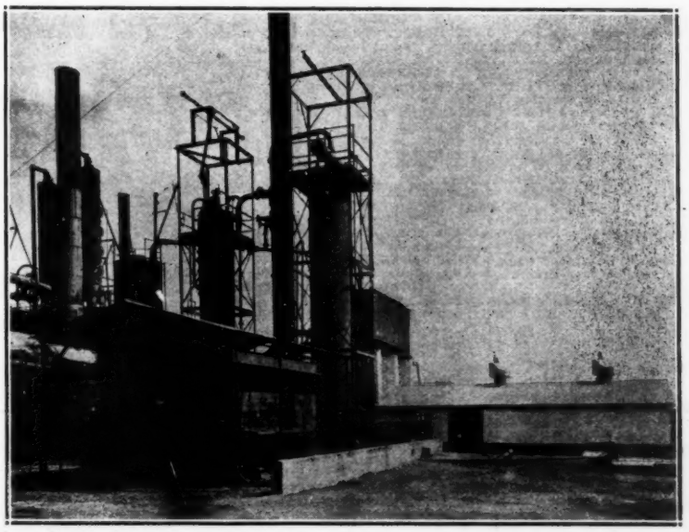
This arrangement provides for use of the heat in the stabilizing plant. The volume of gas oil thus diverted through the stabilizer is dependent upon the load placed on the stabilizer, but there is plenty heat available under any normal operating condition to carry on the work of the stabilizer.

No Coke Produced

No coke is formed in the normal operation of the unit. A careful study of the possible degree of reduction for various charging stocks over long periods of continuous operation, has proven that low gravity residual oils can be produced by this process which will meet fuel oil specifications.

Low Installation Cost

Since pressure performs no valuable function in this cracking operation, the evaporator, bubble tower, and all auxiliary equipment are inexpensive construction compared to contemporary cracking processes. Relatively high temperatures are limited to the radiant section of the furnace coil, consequently special alloy steel is only required in one stage of the process.



Automotive distillate unit at the Lubrite Refining Corp. plant in East St. Louis, Ill., on which trial runs were made in developing the Pratt process.

GREGG COUNTY, EAST CENTRAL TEXAS, NOW GETTING THE LARGEST PLAY

By L. E. Bredberg
Fort Worth Bureau, The Oil and Gas Journal

FORT WORTH, Tex., Oct. 13.—C. M. Joiner's No. 1 Mrs. Daisy Bradford in the Juan Ximinez (Ximenes) Survey, central Rusk County, continues to hold much interest for all who have been leasing, or contemplating leasing or drilling in East Central Texas. Those who have been pessimistic about the discovery holding up, or opening another Woodbine Pool, are beginning to admit that although the well itself is not an exceptionally large one, it no doubt is the forerunner of many other producers around it, many of which may equal the best wells in the Van Pool, Van Zandt County, another Woodbine Pool which was discovered just one year ago, October 14, 1929.

The pendulum of leasing and royalty buying activities has swung towards the north from the new discovery of Joiner, and Gregg County is getting the largest play from independents and companies, although other adjoining counties are feeling the effects of the discovery in Rusk.

Total depth of the Joiner hole remains at 3,594 feet. Tubing was run to 3,522 feet and the well has been flowing through this tubing, although for 20 hours after the tubing was run the well failed to flow. It began flowing on October 10 through the tubing, making 65 bbls. the first hour, 32 bbls. the second hour and a total of 147 bbls. the first four hours. During the 24 hours ending 7 a.m. October 12 it flowed 327 bbls.

Gas is escaping around the casinghead connections, and tubing is being pulled to rerun it with a packer. Gas pressure will be held by this method, and the well is expected to pick up more in production, for there is only a small amount of gas coming from the sand, and if it can be saved for producing the well an increase in flow may be expected, stepping the production up around 400 bbls.

Many tentative locations have been mentioned for various tracts in the vicinity of the well, but so far only two have become realities, and a rig is being built on one of them at this writing. This rig is going up on Frank Foster and other's No. 1 Ashby, located 195 feet from the north and 1,204 feet from the west of a 75-acre tract in the Juan Ximenes Survey. Alford and others have staked location for their No. 1 W. L. Thrash, 1,103 feet from the south and 42 feet from the east of the B. Smith Survey.

Nothing of exceptional importance took place in the Van Pool, although two wells were added to the list of producers in the area around George Anderson and others' No. 1 Sanger Brothers, which extended production to the northeast some time ago. This area lies almost midway between the unit producing area and the Carroll district, and now has three wells producing, which were drilled by independent operators. Broderick & Calvert completed one to the north, about 1,500 feet, two weeks ago, and Anderson & Fogelson completed one this week on the York farm, and the Pure Oil Co. completed one in the area offsetting Anderson and others' No. 1 Sanger Brothers to the west, on the O. L. and L. L. Swain farm.

East Central Texas Production

Average daily production week ending October 11:

Boggy Creek	3,490
Cedar Creek	45
Currie	310
Hill County	30
Mexia	4,017
Minerva	545
Nigger Creek	145
Powell	5,294
Richland	150
Thrall	41
Van	28,566
Wortham	590
Rusk County	88
Total	43,311
Week ending October 4	42,716
Increase	595

COMPLETIONS IN EAST CENTRAL TEXAS

Bowie County

Lee Timberlake's No. 1 Tidwell, dry and abandoned, total depth 3,008 feet.

Panola County

Natural Gas Production Co.'s No. 3 Tom Moore, initial production 23,536,000 feet of gas, total depth 4,720 feet.

Van Zandt County

Pure Oil Co.'s No. 1 A. D. Clark, initial production 110 bbls., total depth 2,927 feet. Pure Oil Co.'s No. 4 A. R. Tunnell, initial production 110 bbls., total depth 2,937 feet. Shell Petroleum Corp.'s No. 7 E. L. Fowler, initial production 108 bbls., total depth 2,970 feet. Pure Oil Co.'s No. 1 O. L. and L. L. Swain, initial production 384 bbls., total depth 2,955 feet.

EAST CENTRAL TEXAS WILDCATS

Week Ending October 11

FANNIN COUNTY

North American Pet. Co.'s No. 1 Allen, 700 ft. N and 150 ft. W in N. R. Broadfoot Sur., 9 miles N of Honeygrove ..... Shut down 1,409 ft.

S. M. Rogers' No. 1 McSwain, 300 ft. S and E of Michael Daly Sur., in Juana Telgando Sur., 1½ miles NE of Lomasco ..... Shut down 1,500 ft.

GREGG COUNTY

M. S. Hammond's No. 1 J. M. Hamby, 278 ft. from E line, 1,667 ft. S of Hamby 3,200-ac. tract, Martin Lant Sur. ..... Rigging up.

HENDERSON COUNTY

H. E. Ashburn et al's No. 1 T. E. Barry, center of Barry's 59-ac. tract in A. York Sur. ..... Top Pecan Gap 2,859 ft.; shut down 2,960 ft.

E. L. Chapman's No. 1 Cade, 1,662 ft. from N and 2,694 ft. from W, 660 ft. W of No. 1, J. B. Dorsey Sur. ..... Location.

George Pace et al's No. 1 Mrs. Sarah Anthony, 273 ft. N and 122 ft. W of SE cor. of S. Anthony 632-ac. tract, Jose W. Battvan Sur. ..... Shut down 3,240 ft.

Texas State Oil Co.'s No. 1 Skinner, 150 ft. from E and 150 ft. from S. J. Henshaw Sur. ..... Location.

HUNT COUNTY

Branson et al's No. 1 West, 350 ft. N, 350 ft. W of W 60-ac. tract, Jas. Roocee Sur. ..... Shut down 3,250 ft.

Mamie S. Hammond's No. 1 W. H. Adams, center of survey, west of Branson Sur., J. A. McFarland Sur. .... Derrick blew down.

KAUFMAN COUNTY

Shaw & Alexander's No. 1 Barrow, 2,360 ft. S and 200 ft. W of R. A. Terrell Sur., 4½ miles N of McCoy. ..... Shut down 3,314 ft.; fishing for drilling pipe.

LAMAR COUNTY

Everett & Allen's No. 1 Guest, 350 ft. S and 2,046 ft. E of 100-ac. tract, L. Roberts Sur. ..... Spudded and shut down.

NAVARRO COUNTY

Young et al's No. 1 Farmer, 700 ft. from S and 400 ft. from E of 110-ac. farm in F. Finley Sur. ..... Shut down 960 ft.

RAINS COUNTY

Everett & Morrison's No. 1 Franklin, 640 ft. from S and E of 75-ac. tract in John Christian Sur., 6 miles SE of Emory ..... Spudded and shut down.

RUSK COUNTY

Clem S. Clark's No. 1 Maude R. McCafflin, 427 ft. from N, 166 ft. from W of farm, Ellie Blackburn Sur. .... Coring 2,719 ft.; bailed hole; showed brackish water and rainbow of oil.

Alford et al's No. 1 W. L. Thrash, 1,103 ft. from N and 420 ft. from E of SE cor. of B. Smith Sur. ..... Location.

Frank Foster et al's No. 1 Ashby, 195 ft. from N and 1,204 ft. from W of 75-ac. tract, Juan Ximenes Sur. ..... Building rig.

C. M. Joiner's No. 3 Bradford, Juan Ximenes Sur. ..... Flowing one head every 13 hrs.

Mass et al's No. 1 Matthews, 3,244 ft. from N, 4,356 ft. from E, Dalines Cartinas Sur. ..... Derrick down.

Rosenfield's No. 1 L. A. Pinskton, 150 ft. from N and 263 ft. from W of Pinkston 77-ac. tract, Maria V. Pena Sur. ..... Drlg. 860 ft.

SMITH COUNTY

Owens & Sloan Oil Co.'s No. 1 Stearns, 846 ft. along W lines of John Waller Sur. from NE cor. of J. O. Dillard Sur., and 80 ft. E at right angles to W line of J. Waller Sur. ..... Shut down 3,509 ft.

Sun Oil Co.'s No. 1 D. McGehee, 500 ft. W and 350 ft. S of SW cor. of Mrs. Julia Phillips 55-ac. tract, Thomas Quevado Sur. ..... Coring 1,418 ft.

Thayer & Rogers' No. 1 Willingham, 150 ft. N and W of 14.5-ac. tract, Jacob Hernin Sur. ..... Fishing 1,536 ft.

Winona O. & G. Co.'s No. 1 Freeman, 150 ft. from S, W of 89-ac. tract in A. J. Legrone Sur., 4 miles SE of Winona ..... Shut down 3,509 ft.

VAN ZANDT COUNTY

Anderson et al's No. 1 York, 65 ft. from E and 150 ft. from S of excess strip, offset to SW cor. Shell Pet. Corp.'s Taylor lease, John Walling Sur. ..... Shut down 2,932 ft.

L. R. Barton's No. 1 Wamble, 300 ft. from S and W of 100-ac. tract in Pleasant Young Sur. ..... Derrick.

D. H. Byrd's No. 1 W. H. Mawes, 150 ft. from S and 150 ft. from W. J. Piles Sur. ..... Drlg. 3,294 ft.; Pecan Gap 3,268 ft.

S. L. Chapman's No. 1 Charles Wolverton, 215 ft. from N, 60 ft. S of NE cor. of Wolverton 10-ac. tract, William James Sur. ..... Drlg. 4,010 ft.

Cranfill & Germany's No. 1 Swain, 137 ft. N and 50 ft. from W of excess strip on W side of O. L. and L. L. Swain farm ..... Shut down 14 ft.

T. Daniels' No. 1 Fannie Cumbine, 185 ft. S and 175 ft. E of NW cor. 156-ac. tract, John Wright Sur. ..... Shut down 2,275 ft.

Dennis Oil Co.'s No. 1 C. W. Morris, 100 ft. from N and 300 ft. from E lines of Morris 160-ac. tract in C. L. Morris Sur., 5 miles SE of Ben Wheeler ..... T. D. 3,971 ft.; will abandon.

Hartt Oil Co.'s No. 1 Dr. L. M. Cox and A. C. Night Sur., 1,785 ft. N of S line and 524 ft. E of W line ... Spudded and shut down.

Humble Oil & Ref. Co.'s No. 1 A. J. Fowler, 150 ft. from S and E of farm, John Walling Sur. ..... Location

Humble Oil & Ref. Co.'s No. 5 R. S. Blake, 150 ft. from N and 150 ft. from E of SW cor. of Mrs. E. E. Carroll farm, John Walling Sur. ..... Location

Humble Oil & Ref. Co.'s No. 6 R. S. Blake, 150 ft. from N and 150 ft. from W of SW cor. of Mrs. E. E. Carroll farm, elevation 485 ft.; John Walling Sur. ..... Location

Humble Oil & Ref. Co.'s No. 3 Carroll, 150 ft. from S and W of farm, William Daniel Sur., elevation 486 ft. ..... Location

Pure Oil Co.'s No. 1 R. D. Clark 42 acres, 299 ft. S of N line and 150 ft. E of W line, A. H. Wiley Sur. .... Location

H. Helms et al's No. 1 Bogue, 647 ft. W and 155 ft. S of SE cor. of J. M. Brown 70-ac. in Marshall University Sur., SE of Van ..... Shut down 1,700 ft.

B. P. Hervey's No. 1 Foster & Smith, 150 ft. S and 150 ft. W of 104-ac. tract, Margaret Neal Sur. ..... Shut down 4,601 ft.

Howard & Dooley's No. 1 Elliott 188-ac. tract in W. H. Bundy Sur. ..... Derrick.

Humble Oil & Ref. Co.'s No. 2 Carroll, 750 ft. W of E line and 250 ft. N of S line of Carroll 988-ac. tract, William Daniel Sur. ..... Drlg. 2,475 ft.

Humble Oil & Ref. Co.'s No. 1 L. A. Dowdle, 1,027 ft. N of S line and 150 ft. E of W line, William Daniel Sur. Temp. abd. 2,987 ft.

Humble Oil & Ref. Co.'s No. 4 Blake, 735 ft. W of most NE line and 250 ft. S of N line of Blake 2,014-ac. tract, John Walling Sur. ..... T. D. 2,930 ft.; ready to bring in

Imperator Oil Co.'s No. 1 G. J. Luther, in SW cor. G. J. Luther 32-ac. tract ..... T. D. 2,900 ft.; to set csg.

Imperator Oil Co.'s No. 2 G. W. Carter, 175 ft. from S and 35 ft. from W of G. W. Carter 171-ac. tract, William Daniel Sur. ..... Shut down.

Jenkins et al's No. 1 V. T. Davis, SE cor. of 139.8-ac. tract, Nacogdoches County School Land ..... Swab 12½ hrs., 2½-in. tubing; small show oil; shut down 3,031 ft.

Kraft & Kelsey's No. 1 Enas in Vacancy strip on E side of Sam Allen and Wylie Enas farms in J. Prado Sur.. Drlg. 2,010 ft.

T. W. Moore's No. 1 Kellam, C of 52-ac. farm in Jesse Russell Sur. ..... Location.

Priest et al's No. 1 Blewitt, 175 ft. NW and SW of SE cor. of NW 84-ac. tract, E. Porter Sur. ..... Drlg. 3,200 ft.

Pure Oil Co.'s No. 1 Neills, 250 ft. from N and 200 ft. W of 86-ac. tract, John Walling Sur. ..... Running tubing 2,928 ft.

Pure Oil Co.'s No. 1 Swain, 92 ft. N and 150 ft. E of 43-ac. tract, Walling Sur. ..... Drlg. 2,581 ft.

Pure Oil Co.'s No. 1 Davis, 127 ft. from S and 200 ft. from W of 139-ac. tract, Nacogdoches County School Land ..... Derrick standing.

Pure Oil Co.'s No. 1 D. O. Mayo, 225 ft. E of W line and 200 ft. S of N line of 295 acres, J. Prado Sur.... Drlg. 2,060 ft.

Pure Oil Co.'s No. 1 Mertie Elliott 161-ac. tract, 217 ft. E of W line and 672 ft. S of N line of lease, A. H. Wiley Sur. ..... Cement setting 308 ft.

Pure Oil Co.'s No. 2 Mrs. M. F. Shirley 38-ac. tract, 163 ft. E of W line and 93 ft. N of S line of Mrs. M. F. Shirley 38-ac. tract, John Walling Sur. ..... Reaming 2,260 ft.

Shell Pet. Corp.'s No. 2 Taylor, 150 ft. from N and 139 ft. from E of 30-ac. farm ..... Drlg. 2,406 ft.; top first chalk 1,474-1,618 ft.; top second chalk 2,346 ft.

Shell Pet. Corp.'s No. 3 Taylor, 150 ft. from S and 65 ft. W of 30-ac. farm ..... Drlg. 2,596 ft.; top first chalk 1,540-90 ft.; top second chalk 2,350-2,528 ft.

Vitek Oil Co.'s No. 1 Smith, 150 ft. S and 15 ft. from W of L. A. Smith 40-ac. farm in John Walling Sur. .. Derrick.

The Texas Company's No. 2 R. A. Tunnell 100 acres, 250 ft. S of N line and 200 ft. W of E line, John Walling Sur. ..... Location

Maud Powell's No. 1 Killam, 1,360 ft. from NW, along SW line from most S cor. of 52-ac. tract and 425 ft. NE to SW line, Jessie Russell Sur. ..... Rigging up.

WOOD COUNTY

Big Indian Oil Co.'s No. 1 R. J. King, 450 ft. W of E line and 150 ft. N of S line of King's 100-ac. tract in Wm. Barnhill Sur. ..... Shut down 4,862 ft.

Leche & Clark's No. 1 A. C. Pick, 165 ft. S of NE cor. G. C. Reeves 25-ac. tract, Daniel Fuller Sur. .... Shut down 997 ft.

TEST WILBUR'S REFUSAL

WASHINGTON, D. C., Oct. 13.—The State of Colorado has been given permission by the Court of Appeals of the District of Columbia to participate in the hearing of the case of Wilbur, Secretary of the Interior, against the United States. This is known as the McLennan case brought to test the right of the Secretary to refuse to issue permits to prospect for oil and gas on the public domain.—C. E. K.

WILDCAT OPERATIONS IN TEXAS PANHANDLE

(Continued from Page 58)

Prairie O. & G. Co.'s No. 1 Reynolds, 330 ft. S and E, NW, Sec. 84, Blk. 3, I.&G.N. Sur. ..... Drlg. 2,351 ft.
W. A. Scott's No. 1 Cobb, 330 ft. S, 425 ft. W, N½ SE, Sec. 184, Blk. 3, I.&G.N. Sur. ..... Estimated 4,000,000 ft. gas 2,875 ft; fishing 2,910 ft.
Shamrock O. & G. Co.'s No. 1 Reynolds, 330 ft. N and E, SE SE, Sec. 84, Blk. 3, I.&G.N. Sur. ..... Standardizing 2,370 ft.
Skelly Oil Co.'s No. 1 Vicars, 330 ft. N and E, W½, Sec. 127, Blk. 3, I.&G.N. Sur. ..... Drlg. 2,250 ft.
Skelly Oil Co.'s No. 1 Heithoit, 150 ft. N, 3,806 ft. W, Sec. 153, Blk. 3, I.&G.N. Sur. ..... Drlg. 290 ft.
Skelly Oil Co.'s No. 2 Vicars, 330 ft. N and W, SW, Sec. 127, Blk. 3, I.&G.N. Sur. ..... Standardizing 1,027 ft.
Smith's No. 1 Morse, 200 ft. S, 330 ft. W, Sec. 6, Blk. 26, H.&G.N. Sur. ..... 3,000,000 ft. gas 2,150-70 ft; S.D. 2,892 ft; 400 ft. oil in hole.
Southern Pet. Explin. Co.'s No. 1 Baird, 330 ft. S and W, NW, Sec. 127, Blk. 3, I.&G.N. Sur. ..... Spudding.
Southern Explin. Co.'s No. 2 Vaughn, 330 ft. S and E, SW, Sec. 138, Blk. 3, I.&G.N. Sur. ..... Drlg. 3,221 ft; S.O. 3,200 ft.
Sullivan & Ochiltree's No. 1-A Morse, 330 ft. S and W, N¼ NE, Sec. 15, Blk. A-9, H.&G.N. Sur. ..... Rig.
The Texas Co.'s No. 3 Brown, 150 ft. S, 330 ft. W of 247-ac. lease, Sec. 137, Blk. 3, I.&G.N. Sur. ..... Location.

HUTCHINSON COUNTY

Dixon Creek Oil Co.'s No. 1 Johnson Bros., 330 ft. N and W of E 60 ac. of NW 100 ac., Sec. 1, Blk. X03, H.&O.B. Sur. ..... T.D. 2,065 ft; set 10-in. csg.
Great Plains O. & G. Co.'s No. 1 Sanford, C of S 160 ac. of N 320 ac., Sec. 87, Blk. 46, H.&T.C. Sur. ..... **Drlg. 2,200 ft.**
Huber Prod. Co.'s No. 1 Johnson Bros., 330 ft. N and E, E½ NW, Sec. 30, Blk. Y, A.&B. Sur. ..... **Drlg. 2,185 ft.**
Huber Prod. Co.'s No. 1 Johnson Bros. (Pure), 330 ft. S and E of E 240 ac., Sec. 29, Blk. Y, A.&B. Sur. ..... Drlg. 2,505 ft.
Texas Interstate P. L. Co.'s No. 1 Bivins, C E½ of N 160 ac., Sec. 91, Blk. 6, H.&T.C. Sur. ..... Location.
Lanier et al's No. 1 Johnson Bros., 990 ft. S, 330 ft. E, W½ SE, Sec. 29, Blk. Y, A.&B. Sur. ..... Spudded.
Phillips Pet. Co.'s No. 1-A Pease, 330 ft. S, 380 ft. E, Sec. 9½, Z. C. Collier Sur. ..... Drlg. 3,010 ft.
Prairie O. & G. Co.'s No. 1 Read, C SW, J. M. McDonald Sur. ..... **Drlg. 2,140 ft.**
Sinclair O. & G. Co.'s No. 1-C Johnson Bros., 330 ft. N and W, NE, Sec. 32, Blk. Y, A.&B. Sur. ..... Drlg. 2,430 ft.
Sinclair O. & G. Co.'s No. 1-A Johnson Bros., 330 ft. N, 430 ft. E, NW, Sec. 32, Blk. Y, A.&B. Sur. ..... **Location.**
Skelly Oil Co.'s No. 1 Johnson Bros., 660 ft. S and W, SE, Sec. 30, Blk. Y, A.&B. Sur. ..... S.O. 3,065 ft. and 3,108-10 ft; S.D. 3,110 ft.
Spurlock et al's No. 1-A Christian, 440 ft. S, 330 ft. W, NE cor. SE SE, Sec. 33, Blk. Y ..... 60,000,000 ft. gas; S.D. 3,219 ft; shot 140 qts. 3,150-3,220 ft; C.O.
Stansylvanian Oil Co.'s No. 1 Whittenburg, 330 ft. S and W, Sec. 129, Blk. Z, E.L.R.R. Sur. ..... S.D. 3,005 ft.

LIPSCOMB COUNTY

Brown et al's No. 1 Box T Ranch, SW NE, Sec. 612, H.&T.C. Sur. ..... **S.G. 3,760 ft; S.D. 4,142 ft.**
Okla. Public Service Co.'s No. 1 C. W. Jones, NE SW, Sec. 100, H.&T.C. Sur. ..... Lowering 5 3/16-in. csg; T.D. 5,003 ft.

LUBBOCK COUNTY

Center Oil Co.'s No. 1 Bowles Ranch ..... Small S.O. 1,133-40 ft; S.D. 4,167 ft

MOORE COUNTY

Dana O. & G. Co.'s No. 1 R. Vtey, 330 ft. N, 330 ft. E, W½ SE, Sec. 135, T.&N.O. Sur. ..... Location.
Delmar Oil Co.'s No. 1-A Jones, 330 ft. N, 990 ft. E, NW, Sec. 171, Blk. 3-T, T.&N.O. Sur. ..... **Rigging up standard tools** 2,618 ft.
Home Gas Co.'s No. 1 Reeder, 330 ft. N and W, N½ E½ NE, Sec. 191, Blk. 3-T, T.&N.O. Sur. ..... Drlg. 2,435 ft.
Morton et al's No. 1 Rupert, 660 ft. N, 330 ft. E, NW, Sec. 191, Blk. 3-T, T.&N.O. Sur. ..... Cellar.
Sunray Oil Co.'s No. 1 C. R. Jones, 330 ft. E, 330 ft. S, W½ SW, Sec. 164, T.&N.O. Sur. ..... Drlg. 2,400 ft.
Sunray Oil Co.'s No. 2 Jones, 330 ft. S, 990 ft. E, W½ SW, Sec. 164, Blk. 3-T, T.&N.O. Sur. ..... **Rig on ground.**
Shamrock O. & G. Co.'s No. 1 Coffee, 330 ft. E, 330 ft. N, E 160-ac. tr., Sec. 355, H.&T.C. Sur. ..... **Standardizing 2,930 ft.**
Gulf Prod. Co.'s No. 1 Kilgore, C SW, Sec. 22, Blk. P. Mc., E.L.R.R. Sur. ..... **Gas estimated 15,000,000 ft. 3,050-60 ft; T.D. 3,645 ft; to complete as gasser.**
Texas Interstate P. L. Co.'s No. 1 Sneed, Jr., C NE, Sec. 48, Blk. 6-T, T.&N.O. Sur. ..... Drlg. 1,311 ft.
Texas Interstate P. L. Co.'s No. 1 Sneed, Jr., C NE, Sec. 6, Blk. B-10, E.L.&R.R. Sur. ..... Location.

MOTLEY COUNTY

Matador Oil Corp.'s No. 1 Owens, C NE, Sec. 10, Blk. G, B.&B. Sur. ..... S.D. 580 ft.

OLDHAM COUNTY

Chambers et al's No. 1 Herring, CNL, Sec. 29, Blk. S, G.C.&S.F. Sur. ..... S.D. 680 ft.

POTTER COUNTY

Canadian River Gas Co.'s No. 1 McBride estate "A," 4,950 ft. S, 330 ft. W, E½ S½, Sec. 98, Blk. 46, H.&T.C. Sur. ..... S.D. 2,000 ft.
Texas Interstate P. L. Co.'s No. 1 Rockwell, C N½ of S½, Sec. 102, Blk. 46, H.&T.C. Sur. ..... Location.

RANDALL COUNTY

W. A. Patterson's No. 1 Palo Duro, Sec. 60, Blk. K-14. .. S.D. 1,250 ft.

WHEELER COUNTY

Guernsey Oil Co. et al's No. 1 Sewell, 320 ft. N and E, Sec. 33, Blk. 13, H.&G.N. Sur. ..... Rig.
McGee et al's No. 1 Jolly, C NE, Sec. 15, Blk. A-8, H. &G.N. Sur. ..... T.D. 2,030 ft.
Wischkamper et al's No. 1 Kiser, 330 ft. N and E of SW, Sec. 33, Blk. 17, H.&G.N. Sur. ..... S.D. 2,040 ft.
Woodley et al's No. 1 Sloss & Admire, 660 ft. N, 330 ft. E, Sec. 47, Blk. 13, H.&G.N. Sur. ..... S.D. 1,325 ft.
Vollmert's No. 1 Porter, 330 ft. S and E, NE, Sec. 15, Blk. 27, H.&G.N. Sur. ..... S.D.

WILDCAT OPERATIONS IN WEST TEXAS

(Continued from Page 57)

Cranfill Bros. and Gulf's No. 1 J. B. Tubb, 2,310 ft. from N and 330 ft. from E of Sec. 8, Blk. B-37, Public School Land ..... Top pay 4,295 ft.; flowed 117 bbls. oil in 13 minutes; total production 418 bbls.; total depth 4,296 ft.

CROCKETT COUNTY

Doleman & Moore's No. 1 Perner, 3,135 ft. from N and 1,485 ft. from E of Sec. 36, Blk. 2, I.&G.N. Sur. ..... Spudded and shut down.
Magnolia Pet. Co.'s No. 2 Hoover, 2,310 ft. from S and 335 ft. from E of Sec. 2, Blk. FF, B.&B. Sur. ..... Swabbed 111 bbls. in 11 days; total depth 2,056 ft.

CULBERSON COUNTY

Grisham & Hunter's No. 2 Garren, 2,475 ft. from S and 1,566 ft. from E, Sec. 20, Blk. 89, Public School Land ..... Shut down 1,520 ft.; show oil 1,400-15 ft.
Kornrumpt et al's No. 1 Garren, 330 ft. S and W, Sec. 15, Blk. 79, Public School Land ..... Cleaning out 1,025 ft.

ECTOR COUNTY

C. P. Davis et al's No. 1 Hendricks, C SW Sec. 46, Blk. 42, Twp. 2s, T.&P. Sur. ..... Drlg. 4,400 ft.
H. F. Wurtz' No. 1 E. A. Ibbetson et al, 330 ft. from N and E lines of NW, Sec. 16, Blk. 46, Twp. 3s, G.M. M.Br.&A. Sur. ..... Shut down 2,540 ft.
Simms Oil Co. et al's No. 4 University, 1,650 ft. from S and 1,320 ft. from E of Sec. 1, Blk. 35 ..... Drlg. 3,286 ft.
Skelly Oil Co. and Republic Prod. Co.'s No. 1 McKenzie, 990 ft. from S line and 330 ft. from E line of Sec. 28, Blk. 45, Twp. 2s, T.&P. Sur. ..... Shut down 3,750 ft.; flowed 110 bbls. on July 12, shut in for storage.
The Texas Company's No. 9 Connell, 330 ft. from N and 440 ft. from W of SE cor. Sec. 1, Public School Land .. Drlg. 1,590 ft.

EL PASO COUNTY

Lane-The Texas Company's No. 1 Malone, 2,110 ft. from SW and NW of Section 46, J. M. Day Sur. ..... Shut down 3,089 ft.

FISHER COUNTY

Condor Pet. Co.'s No. 1 Wilson, 330 ft. from N and 1,200 ft. from W, Sec. 6, W. E. Richardson Sur. ..... Rigging up.
Cranfill & Reynolds' No. 2 Flannigan, 330 ft. from S and E of W half of Section 200, B.B.B.&C. Sur. ..... 2,500 ft. oil in hole from 3,090-96 ft.; shut down 3,130 ft.; plugged back to 3,124 ft.; no results from 10-qt. shot.
Cranfill & Reynolds' No. 3 Willingham, 330 ft. from S and E of Sec. 307, B.B.B.&C. Sur. ..... Drlg. 2,620 ft.
The Texas Company's No. 2-A Stephens, 330 ft. from S and E, Sec. 79, Blk. 1, H.&T.C. Sur. ..... Rigging up rotary.
The Texas Company's No. 1-B Teagarden, 1,990 ft. from S and 440 ft. from E, Sec. 8, W. E. Richardson Sur.. Rigging up.

GARZA COUNTY

Pandem Oil Corp.'s No. 2 Stokes, 330 ft. from N and 990 ft. from E of Sec. 31, Blk. 5, G.H.&H. Sur. ..... Drlg. 2,300 ft.
Pandem Oil Corp.'s No. 1 Justice, 330 ft. from S and W of Sec. 12, Blk. 4, H.&G.N. Sur. ..... Spudded and shut down.

GLASSCOCK COUNTY

Timberlake & Snyder's No. 1 Meek, 2,310 ft. W and 1,600 ft. N of SE cor. Sec. 7, Blk. 34, Twp. 3s, T.&P. Sur. .. Total depth 2,956 ft.; shut down.
World Oil Co.'s No. 3-C McDowell, 2,310 ft. from S and W of NE cor. Sec. 21, Blk. 34, Twp. 2s, T.&P. Sur. ... Shut down 660 ft.

HOWARD COUNTY

Cosden Oil Co.'s No. 6 Roberts-A, 200 ft. N and E of SW cor. Sec. 129, Blk. 29, W.&N.W. Sur. ..... Sulphur water 1,433-46 ft.; shut down 1,456 ft.
G. F. Getty's No. 1 Snyder, Sec. 27, Blk. 10, Twp. 1s, SW cor. of NE of NE ..... Shut down 1,886 ft.
Greene O. & R. Co. et al's No. 1 Denman, 330 ft. from N and W of E half of NE, Sec. 14, Blk. 30, Twp. 1s, T.&P. Sur. ..... Drlg. 2,675 ft.; top pay 2,615-30 ft.; 1,500 ft. oil in hole.
Merriwether's No. 1 Smith, 150 ft. from S, 2,400 ft. from W, Sec. 45, Blk. 33 ..... 2,000 ft. water in hole; shut down 3,270 ft.; 2,000 ft. sulphur water in hole; will abandon.
Moody Oil Corp.'s No. 23-B Roberts, 990 ft. from N and W of Sec. 127, Blk. 29 ..... Shut down 261 ft.

HUDSPETH COUNTY

Theison's No. 1 University, 2,950 ft. from S and 2,225 ft. from E of Sec. 17, Blk. E ..... Spudded 35 ft. and shut down.
Western States Oil Co.'s No. 1 Gardner & Moseley, NE NW Sec. 12, Blk. 18 ..... Shut down 3,155 ft.
Williams & Williams Drlg. Co.'s No. 1 Noelke, 200 ft. from N and 1,020 ft. from E of Sec. 8, City of San Antonio Sur. ..... Drlg. 2,000 ft.

IRION COUNTY

Bristow et al's No. 1 Nutt, 180 ft. from NW of SW of NW Sec. 6, Gonzales County School Land ..... Top pay 1,459 ft.; testing; total depth 1,465 ft.
Central Oil Co.'s No. 2 Horney, 150 ft. from N and 1,320 ft. from E, Sec. 3, Blk. 3, H.&T.C. Sur. ..... Machine.
Crawford Oil Co.'s No. 1 Williams, 450 ft. from N, 150 ft. from W, Subd. 8 ..... Shut down 1,105 ft.
Cromwell et al's No. 1 Tankersley, 150 ft. from N and 210 ft. from W of E half of Sec. 1,320, G.C.&S.F. Sur... Shut down 1,712 ft.; show oil 1,621-25 ft.
Straughn & Texannati Oil Co.'s No. 1 Tankersley, 150 ft. from S and 750 ft. from W of Sec. 4, Gonzales County School Land ..... Underreaming 8¼-in. casing 948 ft.
P. H. Williams' No. 1 Ash, C of Sec. 20, Washington County ..... Shut down 8,900 ft.; may drill deeper.
Webb et al's No. 1 Nutt, 150 ft. from S and 116 ft. from W of Blk. 5, Gonzales County School Land ..... Location.
F. F. Webb's No. 1 W. H. Williams, 200 ft. from E and 750 ft. from S line, S Wof NE Sec. 10, Gonzales County School Land ..... Shut down 100 ft.

JONES COUNTY

McBest et al's No. 1 Roberts ..... Drlg. 700 ft.
Pope et al's No. 1 Swann, 2,023 ft. from S and 400 ft. from E of I. Miley Sur. No. 381 ..... Drlg. 1,790 ft.

LOVING COUNTY

Arkansas Fuel Oil Co.'s No. 1 Dean, 990 ft. from NE and 2,310 ft. from SE, Sec. 84, Blk. 1, W.&N.W. Sur. ..... Drlg. 1,875 ft.
Eppenauer et al's No. 1 Allen, 2,310 ft. from NE and NW lines, Sec. 90, Blk. 1, W.&N.W. Sur. ..... Drlg. 835 ft.
Lockhart & Co.'s No. 3 Bowen & Wells, 330 ft. from NE and SE of Sec. 92, Blk. 1, W.&N.W. Sur. ..... Shut down 3,383 ft.
Independent O. & G. Co.'s No. 2 Wheat, 990 ft. from NW and 330 ft. from SW, Sec. 85, Blk. 1, W.&N.W. Sur.... Drlg. 820 ft.
Lockhart & Co.'s No. 2 fee, 676 ft. S, 330 ft. W, Sec. 91, Blk. 1, W.&N.W. Sur. ..... Spudded 140 ft.; shut down.
Lockhart & Co.'s No. 3 Hubbard, 1,650 ft. from NE line, 330 ft. NW line of Sec. 83, Blk. 33, H.&T.C. Sur. ..... Rigged up and shut down.
Miller et al's No. 1 Chapman, 225 ft. from NW and 285 ft. from SW line, Sec. 71, Blk. 1, W.&N.W. Sur. ..... Drlg. 3,530 ft.
Rush et al's No. 1 Wheat, 330 ft. from NW and SW, Sec. 77, Blk. 1, W.&N.W. Sur. ..... Cellar.
Slagel Drlg. Co.'s No. 1 Cartwright et al, 2,310 ft. from S and 990 ft. from W, Sec. 1, Blk. 57, Twp. 1, T.&P. Sur. ..... Location.
California Co.'s No. 5 Reagan & McElvain, 990 ft. from NW and 330 ft. from NE of Sec. 84, Blk. 1, W.&N.W. Sur. ..... Building rig.
California Co.'s No. 6 Reagan & McElvain, 330 ft. from SW and 1,650 ft. from SE, Sec. 84, Blk. 1, W.&N.W. Sur. ..... Building rig.
Lee O. White et al's No. 1 Russell et al, 320 ft. from NW and 3,200 ft. from SW, Sec. 80, Blk. 1, W.&N.W. Sur. ..... Shut down 4,005 ft.

MENARD COUNTY

Barnett et al's No. 3 Callan City Co., 300 ft. from S and W, Sec. 1, B.S.&F. Sur. ..... Show oil 709-11 ft.; underreaming 6⅝-in. casing 1,305 ft.
Barnett et al's No. 4 Callan City Co., 1,200 ft. from S and 2,200 ft. from W, Sec. 1, B.S.&F. Sur. ..... Machine.
Panhandle Ref. Co.'s No. 2 Eckhart, 1,820 ft. from W and 1,320 ft. from S of Sec. 10, Blk. 2, T.W.N.G. Sur. ..... 500,000 ft. gas with show oil 2,945 ft.; shut down 3,200 ft.; to plug back to 2,955 ft. to save gas.
Priest's No. 1 Sorrell, 1,000 ft. from E and 200 ft. from S cor. Sec. 132, E.L.R.R. Sur. ..... Shut down 2,490 ft.

MIDLAND COUNTY

Kerwin et al's No. 1 Mathen, 2,310 ft. from N and 335 ft. from W line, Sec. 40, W. L. Gray Sur. ..... Spudded and shut down.

MITCHELL COUNTY

Morrison et al's No. 2 Morrison, 2,390 ft. from N and 660 ft. from E of Sec. 31, Blk. 28, Twp. 1n, T.&P. Sur. ..... Shut down 3,112 ft.

Morrison et al's No. 1 Poe et al, 660 ft. S and 1,980 ft. W, parallel to section lines of NE cor. Sec. 8, Blk. 27, T.&P. Sur. ..... **Spudded 10 ft. and shut down.**

PECOS COUNTY

Barnes et al's No. 1 Sanford, 160 ft. from NW and 157 ft. from SW of Sec. 55, Blk. 10, H.&G.N. Sur. ..... **Shut down 1,385 ft.; top pay 1,350 ft.; half full of oil.**

Bell et al's No. 1 Eaton, 2,310 ft. from NE and 990 ft. from SE, Sec. 33, Blk. 3, H.&T.C. Sur. ..... Location.

Bell et al's No. 1 Schaff & Blackman, 2,310 ft. NE and 330 ft. NW of E cor. Sec. 37, Blk. 3, H.&T.C. Sur., but located in Sec. 38, Blk. 3, H.&T.C. Sur. ..... Rig up.

Curry & Eakin's No. 1 Pecos Valley Oil Co., 1,050 ft. from SE and 1,470 ft. from SW. Sec. 36, Blk. 3, H.&T.C. Sur. ..... **Shut down 1,629 ft.; top pay 1,577 ft.; flowing 15 bbls. per day.**

Dittman's No. 1 Jackson, 2,310 ft. from NE and 330 ft. from NW, Sec. 28, Blk. 3, H.&T.C. Sur. ..... Location.

Dittman's No. 1 Eaton, 2,310 ft. from SW and NW, Sec. 35, Blk. 3, H.&T.C. Sur. ..... Shut down 1,230 ft.

Dittman's No. 2 Eaton, 990 ft. from SW and 330 ft. from SE, Sec. 35, Blk. 3, H.&T.C. Sur. ..... Location.

Dittman's No. 1 Eaton, 330 ft. from NE and SE, Sec. 37, Blk. 3, H.&T.C. Sur. ..... Location.

G. A. Henshaw, Jr., Inc.'s No. 1 University, 1,650 ft. from S and 990 ft. from E, Sec. 32, Blk. 16 ..... Total depth 1,678 ft.; plugged back to 1,673 ft.; filled up 1,400 ft. with fluid.

Humble Oil & Ref. Co.'s No. 1 Kokernot, 1,320 ft. from N line and 1,467 ft. from W line of Sec. 227, Blk. 10, G.H.&S.A. Sur. ..... **Shut down 5,695 ft.**

Humble Oil & Ref. Co.'s No. 1-B Thoman, 1,668 ft. from N and 4,062 ft. from E of Sec. 98, Blk. OW, G.C.&S.F. Sur. ..... **Shut down 1,820 ft.; show oil** 1,740-50 ft.

Lewis & Slagel's No. 1 Bell, 330 ft. from N and W of SE Sec. 12, Blk. 30, Twp. 1s, T.&P. Sur. ..... Location.

Lockhart & Co.'s No. 1 University, C NE of SW Sec. 24, Blk. 16 ..... Drlg. 1,105 ft.

McCurdy & Brown's No. 2 Tippett, 150 ft. from N and W of SE, Sec. 40, Blk. 194, G.C.&S.F. Sur. ..... Location.

Messenger et al's No. 1 Butz, 1,830 ft. from NW and 1,170 ft. from SW, Sec. 54, Blk. 10, H.&G.N. Sur. ..... Drlg. 745 ft.

J. R. Miller et al's No. 1 Bennett, 359 ft. W of CWL Sec. 1, Blk. 119, G.C.&S.F. Sur. ..... **Shut down 1,700 ft.**

J. D. O'Mara's No. 1 Bennett, Sec. 593, 1,460 ft. from S 150 ft. from E, G.C.&S.F. Sur. ..... Total depth 1,230 ft.; top pay **1,089 ft.; plugged back to 1,185** ft.; will drill deeper.

J. O. O'Mara's No. 1 Streety, S of Sec. 1, W. P. Howard Sur. ..... Drlg. by tools 2,210 ft.

Oregon Oil Corp.'s No. 2 Yates, 150 ft. from S and W of Sec. 58, Blk. 1, L&G.N. Sur. ..... **Shut down 2,440 ft.**

Perren Oil Co.'s No. 2 Eaton, C of E of W, Sec. 27, Blk. 3, H.&T.C. Sur. ..... Fishing 1,765 ft.

Plymouth Oil Co.'s No. 1 Perry, 330 ft. from N and W, Sec. 13, Blk. 194, G.C.&S.F. Sur. ..... Total depth 1,920 ft.; top pay 1,892 ft.; flowing 25 bbls. per day.

R. W. Porpus et al's No. 1 State Land, 330 ft. S and W lines of NE, Sec. 28, Blk. OW, T.C. Sur. ..... **Spudded and shut down.**

Pure Oil Co.'s No. 1 Harrison, 2,310 ft. from N and 330 ft. from W of Sec. 203, Blk. 3, T.&P. Sur. ..... Drlg. 2,965 ft.

Riser & White's No. 1 Riser, 2,297 ft. from S and 997 ft. from E of Sec. 24, Blk. 12, H.&G.N. Sur. ..... Shut down 405 ft.

Side & Side's No. 1 Blackstone & Slaughter, C NW of Sec. 34, Blk. A-2, T.C. Sur. ..... **Total depth 2,330 ft.; drlg. up** baller.

Schilling & Slaughter's No. 1 Yates, 1,050 ft. N and 150 ft. E of NW cor. of Runnels County School Land, but located in Sec. 70, Blk. 1, L&G.N. Sur. ..... Location.

California Co. et al's No. 1 Thomas, 990 ft. from NW and SW, Sec. 31, Blk. 34, H.&T.C. Sur. ..... Location.

The Texas Company's No. 1 Wright, 660 ft. S and E of NW cor. Sec. 9, Blk. 131, T.&St.L. Sur. ..... Shut down 3,504 ft.

Warner's No. 1 Webb, 2,550 ft. from NW and 6,100 ft. from NE of Sec. 311, Abst. 756, C. McGinley Sur. ..... Shut down 1,245 ft.

Williams & Moran's No. 1 Heiner Est., 450 ft. from N and 2,490 ft. from W of Sec. 590, G.C.&S.F. Sur. ..... Drlg. 450 ft.

REAGAN COUNTY

Big Lake Oil Co.'s No. 4-C University, 1,120 ft. from N and 1,096 ft. from E of Sec. 1, Blk. 2 ..... **Top pay 8,220 ft.; flowed 1,169 bbls.; total depth 8,697 ft.**

Big Lake Oil Co.'s No. 5-C University, 625 ft. from S and 200 ft. from W of Sec. 25, Blk. 9 ..... Drlg. 5,492 ft.

Texon O. & L. Co.'s No. 4-B University, 1,130 ft. from N and W of Sec. 26, Blk. 9 ..... Drlg. 4,304 ft.

REEVES COUNTY

H. T. Hansford's No. 1 Williams, 150 ft. from S and W, Sec. 17, Blk. 6, H.&G.N. Sur. ..... Shut down 380 ft.

Black & Kink's No. 1 Brooks, 1,980 ft. N and 660 ft. W, Sec. 16, Blk. 50 ..... **Shut down 1,860 ft.; show oil 1,820 ft.; cleaning out after two shots; filled up 200 ft with oil.**

Riggs & Smith's No. 1 Lee Monroe, 2,390 ft. from NE and 330 ft. from NW line, Sec. 34, Blk. 7, H.&L.N. Sur. ..... **Shut down 176 ft.**

Salsbury & Gregory's No. 1 Young Bell, 1,170 ft. from N and 330 ft. from E of Sec. 7, Blk. 5, H.&G.N. Sur. ..... **Temporarily abandoned.**

Lee O. White et al's No. 1 Hershersor, 330 ft. from N and W lines of Sec. 5, Blk. 51, Twp. 10, T.&P. Sur. ... **Shut down 4,415 ft.**

California Co.'s No. 1 Kloh & Rumsey, 1,650 ft. from S and E of Sec. 13, Blk. 54, Twp. 4, T.&P. Sur. ..... Drlg. 3,540 ft. in new hole.

RUNNELS COUNTY

Dutton et al's No. 1 Dean, 5,475 ft. from NE and 1,048 ft. from NW in J. Heil Sur. No. 419 ..... Shut down 1,330 ft.

George W. Boyce's No. 1 Lang, 2,310 ft. N, 6,900 ft. E, Sec. 262 ..... Show oil 2,028 ft.; shut down 2,643 ft.

SCHLEICHER COUNTY

Delmar Oil Co.'s No. 1 O'Harrow, C of NW Sec. 56, Blk. 1, G.H.&S.A. Sur. ..... Drlg. 5,550 ft.

Teas & Gant's No. 1 Allison, 1,320 ft. N and E of SW cor. of Sec. 37, Blk. K, G.H.&S.A. Sur. ..... Drlg. 3,900 ft.

Wesner et al's No. 1 Nicks, 2,310 ft. from N and 2,362 ft. from E of Sec. 77, Blk. LL, T.C. Sur. ..... Shut down 750 ft.

Westyde et al's No. 1 Meador, 1,320 ft. from S and E of Sec. 661, G.C.&S.F. Sur. ..... Location.

George Wilson's No. 1 Page, Sec. 40, Blk. L, 1,290 ft. from N, 1,470 ft. from W, G.H.&S.A. Sur. ..... Shut down 5,027 ft.

SCURRY COUNTY

Byrd & Harmon's No. 1 Murphy, Jr., 320 ft. from N and E of Sec. 114, Blk. 97, H.&T.C. Sur. ..... Top pay 1,750 ft.; show oil 2,312-55 ft.; shot 150 qts. 3,100-35 ft.; pumped 55 bbls. 24 hrs.; total depth 3,501 ft.

Camp Spring Oil Co.'s No. 1 Strayhorn, 330 ft. from S and 1,980 ft. from W of Sec. 154, Blk. 3, H.&G.N. Sur. ..... Cem. cave 875 ft.

I. B. Mimms et al's No. 1 J. J. Koonsman, Sec. 216, Blk. 2, H.&T.C. Sur. ..... Spudded and shut down.

G. E. Dickman and R. B. Pender et al's No. 1 F. C. Davis, 1,000 ft. N and 1,770 ft. W of SE cor. of Sec. 275, Blk. 2, H.&T.C. Sur. ..... Shut down 4,970 ft.

Seifert & Dibble's No. 1 T. M. Blackburn, 2,310 ft. from N and 2,310 ft. from W line of S.c. 155, Blk. 97, H.&T.C. Sur. ..... Shut down 140 ft.

Mid-Kansas O. & G. Co.'s No. 1 Peckham, 330 ft. from S and W of R. N. Miller Sur. ..... Shut down 4,140 ft.

STERLING COUNTY

Beesley et al's No. 1 Brown, 2,940 ft. N and 300 ft. W of SW cor. Sec. 7, Blk. 22, H.&T.C. Sur., but in Sec. 16, Blk. 21, Twp. 4s, T.&P. Sur. ..... Shut down 150 ft.

SUTTON COUNTY

Independent Oil & Gas Co.'s No. 1 Wilson, Sec. 30, Blk. A, 1,650 ft. from N, 2,310 ft. from W ..... Location.

TAYLOR COUNTY

Adams et al's No. 2 Lowe, 150 ft. from N and 750 ft. from W, Sec. 19, Guadalupe County School Land ..... Drlg. 650 ft.

Eastland Oil Co. et al's No. 2 Hunter, 3,418 ft. from S and 2,174 ft. from E of William R. Ellis Sur. ..... Location.

Gibson & Johnson's No. 1 Bingham, 330 ft. N and E of SW cor. their 270.8-acre tract, Sec. 31, Guadalupe County School Land ..... Shut down 2,501 ft.

John B. Jameson's No. 1 Webb, 1,170 ft. S and W of NE cor. Sec. 46, Lunatic Asylum Land ..... Show oil 4,917 ft.; shut down 6,180 ft.

Hucony Oil Co. et al's No. 1 Richie, C SE Sec. 10, Blk. A, S.P. Sur. ..... Shut down 2,392 ft.

Sanger et al's No. 1 City of Abilene, 830 ft. from S and 1,400 ft. from E of Sec. 66, Blind Asylum Land ..... Drlg. 1,000 ft.

Sanger O. & R. Co.'s No. 1 Osborn, 330 ft. from SW of SE Sec. 68, Blind Asylum Land ..... Rigged up and shut down.

TERRELL COUNTY

Big Bend Oil Co.'s No. 1 Bassett, C NW Sec. 155, Blk. D, M.-K.-T. Sur. ..... Drlg. 2,356 ft.

Keck Pecos Trust Co.'s No. 1 Hamilton, C Sec. 6, Georgetown Ry. Sur. ..... Shut down 3,150 ft.

Miller Bros.' No. 1 Allison & Burke, C NW cor. Sec. 10, Blk. 176, T.&P. Sur. ..... Shut down 120 ft.

Mrs. J. B. McPhees' No. 1 Sam Belt, C Sec. 16, Blk. D-7, E.L. Sur. ..... Shut down 880 ft.; moved off machine.

Transcontinental Oil Co.'s No. 1 Goode, 2,152 ft. from E and 330 ft. from S. Sec. 26, Blk. 161, G.C.&S.F. Sur. ... Fishing 5,229 ft.

Woodley & Jones' No. 1 Pankenham, C SE NW Sec. 43, Blk. B-2, C.C.S.D.&N.G. Sur. ..... Shut down 640 ft.

TOM GREEN COUNTY

Belding & Dutton's No. 1 Nosworthy, 2,640 ft. from S and 587 ft. from E of John McNeese Sur. ..... Drlg. 760 ft.

Cosden Oil Co.'s No. 1 William Anson, 2,310 ft. S, 330 ft. W of NE cor. Sec. 20, Blk. 24, H.&T.C. Sur. ..... Location.

Fitzgerald & Taliaferro's No. 1 Bennett, C SW Sec. 1,628, E. H Dinger Sur. ..... Plugged back to 2,405 ft. to straighten hole; shut down 2,447 ft.

Mintex Oil Co.'s No. 1 Campbell Est., 446 ft. from S and 630 ft. from W of Sec. 180, Dist. No. 11, S.P. Sur. ... Shut down 1,704 ft.

Phillips Pet. Corp.'s No. 1 Gulden, 1,250 ft. from N and 1,583 ft. W of Sec. 77, James Webb Sur. ..... Underreaming 8¼-in. casing 3,634 ft.

E. W. Wiley et al's No. 1 Maier, 200 ft. from E, 110 ft. from N, Sec. 6, Blind Asylum Land ..... Shut down 815 ft.

UPTON COUNTY

Cordova Union Land Co.'s No. 1 fee, 330 ft. from S and E line of Sec. 1, Blk. 1, M.-K.-T. Sur. ..... Location.

Duffey et al's No. 2 McClintic, 990 ft. from N an1 330 ft. from E. Sec. 206, Blk. F, C.C.S.D.&R.G.N.G. Sur. .. Location.

Gulf Prod. Co.'s No. 1 King Ranch Oil & Lignite Co., 330 ft. from S and 990 ft. from W line, Sec. 28, Blk. 2, M.-K.-T. Sur. ..... Drlg. 2,775 ft.

Penn and Shell Pet. Corp.'s No. 1 Anderson, 1,320 ft. from S and E, Sec. 37, Blk. Y, C.C.S.D.&R.G.N.G. Sur. ..... **Drlg. 2,445 ft.**

Weekly Oil Corp.'s No. 1 Shirk, 468 ft. from S and 2,317 ft. from E, Sec. 15, Blk. 3, M.-K.-T. Sur. ..... Cellar.

VAL VERDE COUNTY

Independent Operators' No. 1 Whitehead, SE SE Sec. 30, Blk. 4, I.&G.N. Sur., elev. 1,175 ft. ..... Shut down 5,360 ft.

O. O. Owen's No. 1 Mills, Sec. 128, Blk. 1, I.&G.N. Sur., elev. 2,130 ft. ..... Shut down 6,770 ft.

Phantom Oil Co.'s No. 1 Ingram, 175 ft. W of E line and 300 ft. N of S line, Sec. 33, Blk. D-8, E.L. Sur. ..... Shut down 3,035 ft.

Valvert Oil Corp.'s No. 1 Bassett, C NE Sec. 47, Blk. Y .. Shut down 4,009 ft.

WARD COUNTY

Great Basin Oil Co.'s No. 1 Eudaley, 2,140 ft. from NW and 1,170 ft. from SW, Sec. 36, Blk. 4, H.&T.C. Sur... Completed as dry at 1,700 ft. on April 4, 1928.

Gulf Prod. Co.'s No. 5 Hutchings, 330 ft. from S and W, Sec. 3, Blk. F, G.M.M.B.&A. Sur. ..... Shut down 2,803 ft.

Gulf Prod. Co.'s No. 3 Wristen Bros., 220 ft. NE of SW and 220 ft. SE of NW Sec. 18, Blk. 5, H.&T.C. Sur. ... Show gas 1,960-70 ft.; filling up with sulphur water 2,520-77 ft.; salt water 2,545 ft.; plugged back to 2,477 ft.

Magnolia Pet. Co.'s No. 1 Sealy, 330 ft. from S and E of NE cor. Sec. 46, Blk. 2, G.M.M.B.&A. Sur. ..... Drlg. 2,631 ft.

R. F. Owens' No. 1 Johnson, 100 ft. from NE and 1,100 ft. from SE of Sec. 8, Blk. 33, H.&T.C. Sur. ..... Shut down 1,200 ft.

Richardson et al's No. 5 O'Brien et al, 330 ft. from N and 2,970 ft. from W of Sec. 5, Blk. F, G.M.M.B.&A. Sur. ..... Shut down 56 ft.

California Co. et al's No. 1 Lanham, 990 ft. from NE and SE, Sec. 35, Blk. 34, H.&T.C. Sur. ..... Building rig.

Tex-Oil Prod. Co.'s No. 1 Redman, 1,980 ft. NE of SW line and 1,980 ft. SE of NW line, Sec. 152, Blk. 34, H.&T.C. Sur. ..... Shut down 5,077 ft.; show oil 5,070 ft.; shot 140 qts. from 5,047-77 ft.; no results.

Shipley et al's No. 5 Hayzlett, assume common line Secs. 16 and 17 is N and S, 220 ft. S and 1,910 ft. W. Sec. 17, Blk. 5 ..... Standard rig.

Shipley et al's No. 1 Monroe, 330 ft. SE SW Sec. 3, Blk. 1 ..... Shut down 2,520 ft.

T. P. Coal & Oil Co.'s No. 1 Barker, 330 ft. from SW and NW of Sec. 27, Blk. B-29, Public School Land ..... Shut down 2,260 ft.

California Co.'s No. 1 Allen, 2,310 ft. from NE and 330 ft. from SE, Sec. 30, Blk. 34, H.&T.C. Sur. ..... Building rig.

WINKLER COUNTY

Empire Gas & Fuel Co.'s No. 1-C Daugherty, 990 ft. from S and 2,310 ft. from E, Sec. 16, Blk. 74, Public School Land ..... Drlg. 1,370 ft.

Magnolia Pet. Co.'s No. 1 Bashara, 1,650 ft. from S and 2,310 ft. from W, Sec. 17, B-3, P.S.L. Sur. ..... Rigging up.

Magnolia Pet. Co.'s No. 3 Scarborough, 1,650 ft. from N and 990 ft. from W of Sec. 1, Blk. 77, Public School Land ..... Drlg. 1,448 ft.

A. W. Phillips' No. 2 Brown et al, 2,000 ft. S and W of NE Sec. 4, Blk. B-5, Public School Land ..... Shut down 3,120 ft.

Prairie Oil & Gas Co.'s No. 1 Johnson, 2,310 ft. N and E, Sec. 16, Blk. 74, Public School Land ..... Shut down 2,672 ft.

Liner Drlg. Co.'s No. 1 Campbell, 330 ft. from N and E cor. Sec. 2, Blk. B-5 ..... Shut down 4,639 ft.

Shell and The Texas Company's No. 1-B Cowden, 600 ft. from S and W of Sec. 39, Blk. B-5, Public School Land ..... Flowed 124 bbls. fluid per day, 40 per cent water; cleaning out; total depth 3,116 ft.

Turman et al's No. 1 Daugherty, 2,310 ft. from E and 2,310 ft. from S line, Sec. 16, Blk. 74, Public School Land ..... Drlg. 2,140 ft.

CHARACTERISTICS OF DRILLING FLUID

(Continued from Page 95)

tamination imposed on the fluid while drilling.

When the colloidal state of the solid particles in a drilling fluid is disintegrated by chemical rather than by mechanical or electrical means, this disintegration is called peptization. Certain salts, when picked up by the drilling fluid from salt water in a well act to peptize unstable colloids, destroying the forces of cohesion and adhesion.

The formation of gels within a drilling fluid increases the viscosity of the fluid and also contributes to the stability of the suspended particles. In some instances a drilling fluid will be deficient in these gel-forming bodies, hence the solids will settle out freely, while in other instances the gel-forming bodies may be present in such large proportions that they make the mud unduly viscous and thereby prevent the settling out of sand and cuttings and the release of occluded gas. Natural muds from different areas vary widely in the proportions of these gel-forming bodies they contain, hence have very different characteristics. In general the natural drilling muds of Kansas, Oklahoma and North Texas grade from suspensoids to medium colloids, while Gulf Coastal areas yield some very highly colloidal muds at certain horizons. Figure 1 indicates graphically the colloidal qualities and other characteristics of six samples of drilling fluids obtained in various areas.

Control of Fluid Properties

In some instances it is desirable to increase the gelatinous bodies within a drilling fluid and this is done either by the addition of chemicals which will react with some of the naturally occurring constituents of the mud to form gelatinous bodies, or through the addition of aquagel or other materials which form gels when combined with water.

On the other hand, in the treatment of muds which are unduly viscous, having excessive proportions of colloidal gelatinous bodies, it is necessary to add chemical reagents which will modify the cohesive and adhesive effects within the mud. This applies, of course, to cases where it is desired to keep the weight constant, and also to cases where it might be desirable to decrease the viscosity in order to increase the weight by the addition of weighting material. This will allow the viscosity of the mud to be decreased to a point where sand, cuttings and occluded gas are more readily released, although the stability of the colloidal suspension is not materially decreased. Accompanying this change in viscosity there would be a decided easing up in the load on the pumps.

On one type of compound[1] now used in the Gulf Coast area for the chemical treatment of high viscosity drilling fluids the viscosity is lowered to allow release of cuttings and prevent gas cutting or for the addition of weighting material, but the colloidal state of the fluid is further stabilized by the presence of a second colloid, which is strongly adsorbed by the clay particles and acts to protect the particles from the influences tending to cause coagulation or agglutination. It also imparts to the drilling fluid the property of forming a soft gel when the mud is quiet, such as when the drill stem and pumps are stopped. This gelling property acts to prevent sand and cuttings from settling to the bottom of the hole and possibly sticking the drill pipe. Upon being slightly agitated the mud returns to a highly fluid condition that is easily handled by the pumps.

It is reported[2] that recently in a field south of Beeville, Tex., a well was drilling at about 5,500 feet in a formation that made a thick viscous mud, which with weighting material, weighed 12 pounds per gallon. A high-pressure gas sand was then penetrated and the mud became gas cut and threatened to blow out whenever an attempt was made to remove the drill stem. After a number of unsuccessful attempts to remove the drill stem, chemical treatment was resorted to which thinned the mud without decreasing the weight of the fluid. This thinning released the occluded gas and then allowed the addition of more weighting material to 14 pounds per gallon. The drill stem was then removed. This illustration is presented to show a phase of the practical side of the subject.

In the chemical treatment of a drilling fluid the chief objective is to obtain a colloidally stable fluid of a desired viscosity and weight; the viscosity having a nature of slickness instead of stickiness, which allows a more ready release of cuttings, sand and occluded gas.

Effect of Hydrogen Ion Concentration and Adsorption

Theoretically, clay particles reach a state of maximum dispersion in a fluid when alkali is added in sufficient quantities to raise the pH valve (hydrogen ion concentration) to above 9. If that condition alone held true, the addition of an alkali to drilling fluids would be expected to thin the mud.

Actually, however, in many natural drilling fluids, the reaction is entirely different. In such cases the addition of alkalies or alkaline salts produces flocculation and increased viscosity. Figure 2 illustrates this effect on a clay[3]. This effect is due to the presence of soluble metallic salts bordering on a state of true solution in the water content of the drilling fluid, and to the presence of metallic salts in the clay particles. These metallic salts in the mud react through the process of adsorption, with the alkali or alkaline salts added to the mud, forming gelatinous precipitates which actually increase the viscosity of the mud. This is illustrated by the four samples with pH values from 7.1 to 11.9 shown in Figure 2. At the same time as this secondary reaction occurs, there is a deflocculating action which affects the electrolytic condition of the primary colloids but the net result is increased viscosity. The point of this explanation is that the flocculating or deflocculating actions of alkalies on drilling fluids should be interpreted not only on the basis of change in pH values but also on the basis of chemical changes due to adsorption. Figure 2 shows the combined effect of hydrogen ion concentration and adsorption on a certain clay, while Figure 5 shows the effect on a more inert substance[4]. The action of some alkalies and silicates (caustic soda, soda ash, sodium silicate, etc.), which are used in similar problems of other industries, produces some immediate results in changing the viscosity of a drilling fluid but their use in an uncombined form should be accompanied by an assurance that the surface film of cohesive matter produced is sufficiently stable to not be easily broken down under agitation while drilling, or by the peptizing action of salt waters picked up in the wells. Gels formed by these uncombined alkalies often are of a type subject to "weeping," that is, contraction of the gel and liberation of free water.

The special factors in the study of drilling fluid clay suspensions that are not present in similar problems of other industries, and consequently not covered by precedent, are the highly concentrated and widely varied crystalloidal content of the dispersive phase, and the severe mechanical demand and chemical contamination imposed on the fluid while drilling.

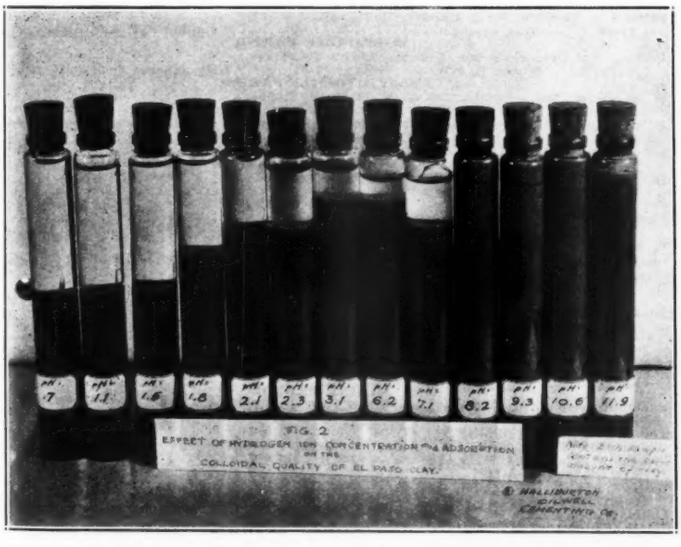


FIG. 2
EFFECT OF HYDROGEN ION CONCENTRATION AND ADSORPTION ON THE COLLOIDAL QUALITY OF EL PASO CLAY.
HALLIBURTON OILWELL CEMENTING CO.

Figure 2—Showing photographically the actual effect of both hydrogen ion concentration and adsorption on the colloid quality of El Paso clay. Each sample shown contains the same amount of clay.

[1] Stabilite.

[2] T. B. Wayne, chemical engineer, Houston, Tex., personal communication.

[3] "El Paso clay" (from Findlay, Tex.).

[4] Baroid.

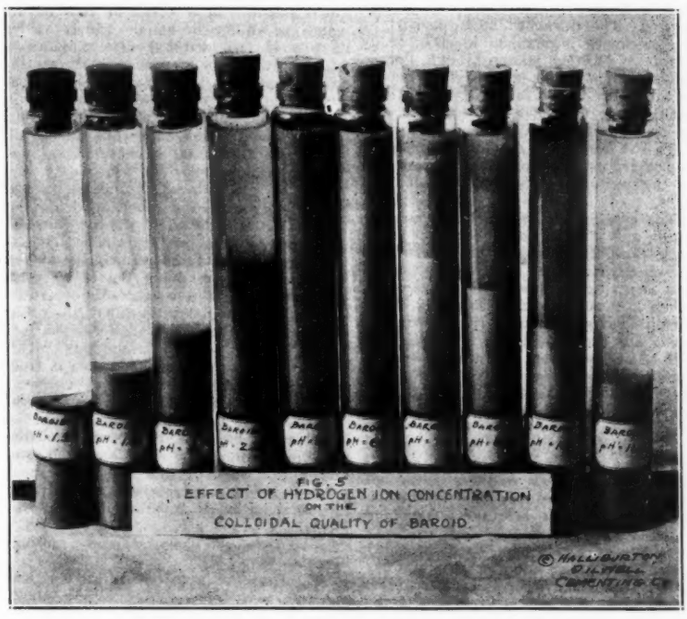


Figure 5—Showing photographically the actual effect of hydrogen ion concentration on baroids.

W. H. HUNT, JR. KILLED

SHREVEPORT, La., Oct. 11.—W. H. Hunt, Jr., air and gas lift expert with Haywood-Williamson Machinery Co., here was killed on a hunting trip. He was putting together an automatic shotgun, not knowing that there were several shells in the magazine, when it was discharged.

DRILL MUD RECLAMATION IN VENTURA, CALIF., FIELD

(Continued from Page 96)

in the classifier to contain about 75 per cent + 200 mesh sand and 27 per cent moisture. Such a product could be readily disposed of.

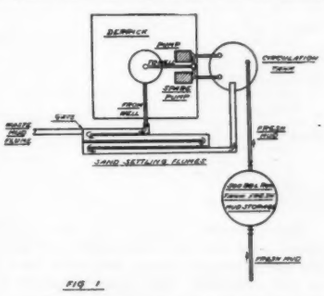
5. A central reclaiming plant will economically reclaim mud, and eliminate the need for waste mud disposal.

Based on these conclusions, a complete central rotary drill mud reclamation plant was built at Ventura this last spring, to reclaim the waste mud from 10 wells, using in all an estimated 10,000 bbls. of mud per day.

A complete flow-sheet of this plant is shown in Figure 2. The spent mud enters the plant from the wells or other sources, in flumes which empty into the surge tank. This has three outlets on the side at different levels to insure as uniform a feed as possible. These three pipes all discharge to a 5-feet diameter by 3 feet deep mixing tank. Four pipe outlets discharge from the mixing tank into the bowl feed launders. No diluting water is added to this feed as it was found more advisable to add it all as a back flow in classifier rake compartments.

Use of Classifiers

Four Dorr bowl classifiers were provided for the removal of the sand and the liberation of the gas. These machines, originally developed for the separation of sand from slimes in the mining industry, depend for their operation on the difference in particle sizes of the mud and sand and the corresponding differences in settling rate when the mud is diluted sufficiently with water. The sand settles out and is removed by a set of rotating rakes in the bowl and reciprocating rakes in the sand raking compartment. The dilute, clean mud overflows continuously from the bowl into an annular launder.



Mud system at individual wells.

Diluting water is added as backflow and flows up through the bowl, washing the mud and sand. The sand discharges from the classifier rakes on to a conveyor belt and from that belt to another one at right angles to the first upon which it is carried away for disposal. The bowl overflow goes directly to the feed well of the thickener, the function of which is to thicken the mud to the consistency required by the wells and to recover the excess water added to the classifiers for reuse on those machines.

This is a Dorr traction thickener, installed in a concrete tank with a dirt bottom. The thickened mud removed by the thickener mechanism is elevated by means of Wilfley pumps to two storage tanks from which it is pumped as needed to the wells. These tanks have overflows back to the thickener and are kept full or nearly full at all times.

Two steam-driven, duplex reciprocating pumps are used to pump the finished mud to the wells through a system of pipe lines.

The overflow of the thickener is clear water and oil. It flows to an oil skimming tank, from which the bulk of the water is withdrawn near the bottom to two centrifugal pumps, by means of which it is returned for use in the classifiers. Provision is made for flowing to waste any excess water in the system. It will be observed that the water used on the classifiers is closed circuited through the thickener and that any quantity within the limits of the pump capacity can be used.

The oil floats on the surface of the water in the skimming tank, and is skimmed at intervals to the adjacent oil storage tank. Here additional separation of water from the oil takes place and water is occasionally drawn off from the bottom. The recovered oil will probably be used as road oil and a small pump has been installed to load tank trucks from the oil tank. An alternative would be to dehydrate it and add it to the well production.

The cost per barrel of reclaimed mud is surprisingly low as a result of the low cost of operation of the plant. Only one operator is required for the reclaiming equipment and one other man attends the boilers which supply steam to the shipping pumps. The classifiers and thickeners are each powered by 5-horsepower motors, the speed of operation being very slow. Complete operation of the plant was established on June 10 of this year, on which day the pumps started returning mud to the field. Since that time the old central mixing plant has never operated and has been permanently shut down, so that the field is entirely dependent on the central reclaiming plant for its mud supply.

Since the beginning of operation, engineers have been present at the plant almost continually, compiling data and operating results and costs as well as studying rotary drill mud properties for use in future problems in this field.

Tabulation of Performance

The following is a tabulation of the average performance of the plant during the first three months' operation:

Plant Feed—	
bbl./day	4,000–15,000
lbs./cu. ft.	70–74
%+200 mesh sand	5–10
Reclaimed Mud—	
bbl./day	4,000–10,000
lbs./cu. ft.	78–82
%+200 mesh sand	1.6–2.0
Sand—	
tons/day (dry)	20–70
% moisture	27–28
%—200 mesh	10–15
Oil Skimming—	
bbl. oil/day	10–25

The reduced amounts of feed noted above were due to a curtailment of drilling operations at times, but it is shown by the operating data that variation in feed quantities had little effect upon the operating results of the plant. There is almost no increase in total daily cost for the greater capacities of the plant, so that the cost per barrel fluctuates directly as the mud handled.

The reclaiming system installed at Ventura has already established itself as a logical and successful means of mud reclamation, by fulfilling in a satisfactory manner the exacting requirements demanded for this work as have been outlined above, and by centralizing the mud reclaiming under competent trained labor. Because of the obvious cheapness of reclaimed mud and the fact that mud consumption can be increased considerably without increasing the total cost per day, operators are able to discard their mud before it becomes contaminated instead of using it long after it has lost its full value for drilling.

Further Possibilities

This system, however, goes much further in its possibilities. The perfect control possible in a plant of this nature and its ability to handle widely varied types of feed without effect upon capacity or quality of product, suggests the fact that the mud properties can be varied at will to suit the needs of drilling in each individual well. For example, it has been found that thin muds will penetrate into sand formations an inch or so, which tends to consolidate and hold in place loose, crumbling sands. Thick muds, on the other hand, do not penetrate at all and in drilling through oil sands where penetration is not desirable because of the resulting swabbing difficulties, thick muds should be used. At each well, the weight of mud could be varied at will by diluting with water, and when a change was desired, the used mud returned to the reclaiming plant, and a new supply of mud drawn from the supply line. Similarly any chemical treatments that might be found useful in producing desirable properties in the mud could be carried out on the batch in circulation at the individual well, and when the work of this batch was completed, it could be returned to the plant where ithe large amount of mud with which it was mixed would counteract the effect of the chemicals and a normal mud be produced.

Certainly the introduction into the field of this new type of reclamation plant, adapted as it is to handling a wide variety of feeds, with the production of consistently satisfactory products, solves the extremely vital problem of used mud disposal and presents an attractive future to users of rotary drill mud everywhere.

TENNESSEE FIELDS

(Continued from Page 72)

ditions can be easily ascertained. Charles F. West of the Armstead Oil Co. is making headquarters at Lafayette and is taking up a large block of leases south of that city. Dr. J. H. Bowles of the geological department of the Potter Palmer interests of Chicago, spent several days in Jackson and Macon Counties. A. L. Pratt of Murphysboro, Ill., and manager of the production at Fox Springs and Mitchell Creek in Clay County, is arranging to drill a well to the St. Peter sandstone, starting probably next week. At present the wells of Mr. Pratt and his associates are averaging about 100 bbls. daily and have proved unusually productive; at one time several years ago daily runs of 300 to 500 bbls. were not uncommon.

Kennedy & Son are drilling at 175 feet on their well on the Hamp Linn farm in Tinsley Bottom; the wells they recently cleaned out and deepened are still holding up and have justified the time and expense of the work. The Cumberland Oil Co. of New York is shut down on the Martin Garrett at 1,000 feet. The deep test of the Jervian Corp. at Wilder, east of Livingston, is drilling at 1,875 feet with nothing of interest reported thus far. Report from the same company's tests at Sparta and McMinnville are that both wells are shut down awaiting further orders.

Cheatham County

Ellis & Young, of Owensboro, Ky., are experiencing some difficulties in setting casing on their test 4 miles northwest of Ashland City in Cheatham County and the well is reported about 225 feet deep.

T. J. Newell and associates are drilling at 600 feet on their No. 2 Oakley with good gas showings reported. Wood and Kenyon are reported at 700 feet on their well a mile north of Oakley; both of these wells are in Dickson County and but a short distance south of the Ellis and Young well. Word from southern part of Tennessee was to the effect that the Chattanooga Gas interests were preparing to make further tests on their big area in eastern Lincoln County, where they already have probably the largest shallow gas well of commercial size in the country.

J. H. McClurkin is drilling at 785 feet on the J. L. Woods farm on Little Trace Creek in Clay County; this well was started in the Fort Payne formation and the shale was found to be 92 feet lower than expected while the Pencil Cave was still lower than the usual interval and these unusual conditions indicate considerable irregularity.

EASTERN FIELDS

(Continued from Page 72)

ment Co. is hauling in tools on the E. J. Hoge farm, Church district. In the same district, W. W. Null and others are drilling at 1,250 feet on the W. Barrack farm, and have started to drill No. 3 on the W. G. Snodgrass farm. In the same district, the Manufacturers Light & Heat Co. has spudded in on the John C. Haskins farm, and in Cameron district, Marshall County, have started a well on the W. B. Hicks farm.

In Wood County, Boggess & Bartlett have started on the Jacob Radabaugh farm, Williams district. In the same district, Beeson & Athey have reached 1,900 feet on the J. B. Henderson farm. In Walker district the Four States Oil Co. has rigged up on the John Roberts farm.

SOUTHWEST PENNSYLVANIA

There were but two completions in southwest Pennsylvania during the week and one was a fair gas well. In Wayne Township, Greene County, the Philadelphia Natural Gas Co. completed a test on the L. D. John farm in the Gantz sand at 2,475 feet, showing for a good gasser. In Brush Creek Township, Beaver County, the Kirk Oil Co. drilled a test on the Henry Shon farm to a depth of 1,800 feet, the Gordon sand, and it is dry.

Drilling in Southwest Pennsylvania

In Amwell Township, Washington County, J. Blaine, Wise & Co. are down to 2,000 feet on the A. G. Blaine farm. In West Bethel Township, the Manufacturers Light & Heat Co. is drilling at 900 feet on the L. A. Ames farm. On the Robert Ealey farm, East Finley Township, the same company has reached 2,000 feet in No. 3,440. In South Franklin Township, the Carnegie Natural Gas Co. is reaching the sand on the Fanny Weir farm. In Chartiers Township, Potts Brothers are getting ready their test on the A. Woodruff farm. In Brush Creek district, Butler County, the McNanny Oil Co. is drilling on the Mowery Brothers property and has reached 1,760 feet.

WILDCAT OPERATIONS IN LOUISIANA-ARKANSAS

(Continued from Page 50)

CONCORDIA PARISH

A. C. Glassell's No. 1 Pecania Plantation, 25 ft. S, 25 ft. W. NE cor. irregular Sec. 46-8-9 ..... Location.
Joe Marr et al's No. 1 Maxwell, C, Sec. 35-3n-8e ..... Reaming to bottom; T.D. 2,896 ft.

DE SOTO PARISH

Ark.-La. P. L. Co.'s No. 3 Johnson, 1,980 ft. N, 1,320 ft. W, SE cor., Sec. 1-11-14 ..... Derrick.
J. W. Clark's No. 1 Tidwell, 250 ft. S, 250 ft. E, NW cor. NW, Sec. 22-13-14 ..... Coring shale and shell 2,735 ft.
S. A. Guy's No. 1 Dowling Bros., 469 ft. E, 382 ft. S, NW cor. NE, Sec. 31-14-14 ..... S.D; sandy shale 1,354 ft.
Bud Harrell's No. 1 Horton, 450 ft. E, 150 ft. N, SW cor., Sec. 4-11-11 ..... S.D. 1,060 ft.
Holly Oil Co.'s No. 1 Talbot (was Philp et al's), 220 ft. S, 730 ft. W, NE cor. NW NE, Sec. 9-13-13 ..... S.D. 1,230 ft.
Keatchie O. & G. Co.'s No. 1 Hallie Smith (was H. E. Weichert's), NE SE, Sec. 31-14-15 ..... Drlg. 620 ft.
Michlouzanna O. & G. Co.'s No. 1 Payne, 410 ft. S, 398 ft. E, NW cor., Sec. 12-11-16 ..... S.D. 2,600 ft.
Odell & Lawton's No. 1 Tidwell-Tull, 300 ft. N, 600 ft. E, SW cor. NW, Sec. 11-13-14 ..... S.W; show gas 3,004 ft; cmtd. bottom.
Pelham & Bunby's No. 1 Rhodes, C S½ SE, Sec. 32-13-14 ..... Pumping S.W. and little oil.

MOREHOUSE PARISH

Pelican Nat. Gas Co.'s No. 1 Tensas Delta Land Co., 1,320 ft. N, 660 ft. E, NW cor., Sec. 17-18-6 ..... Drlg. igneous rock 2,985 ft.

NATCHITOCHES PARISH

W. M. Coats' No. 1 Collins, 730 ft. N, 50 ft. E, C, Sec. 28-9-10 ..... Coring gumbo 3,046 ft.
J. W. Cooper et al's No. 1 Cooper, NW SW, Sec. 35-11-10 ..... Arranging to reset liner and test 1,290 ft.
J. W. Cooper et al's No. 2 Cooper, SE cor. SE SE Sec. 32-11-10 ..... Location.
Cooper et al's No. 1 La. Delta Pecan Co., C SE SE, Sec. 32-11-10 ..... S.D. 1,000 ft.

RED RIVER PARISH

Lucky Strike Oil Co.'s No. 1 Chaffraix, 200 ft. S, 200 ft. E, C, Sec. 33-12-10 ..... S.D. 2,820 ft.
T. G. Shaw's No. 1 Wilkerson, 460 ft. N, 200 ft. W, SE SE, Sec. 4-12-10 ..... Drlg. chalk 1,500 ft.

RICHLAND PARISH

W. C. Feazel's No. 1 Landrum, 620 ft. N, 4,573 ft. E, SW cor., Sec. 6-16-7 ..... Derrick.
Island Gas Co.'s No. 1 Noe, 1,902 ft. N, 660 ft. W, SE cor., Sec. 3-16-5 ..... Top Monroe gas rock 2,365 ft; bailed dry 2,419 ft. and 2,460 ft; D.S. test 2,479 ft; 2,509 ft. and 2,539 ft; S.W; S.D; gumbo 2,549 ft.

SABINE PARISH

Boone, trustee's No. 1 Turner, 40 ft. N, 140 ft. W, SE cor. NW NW, Sec. 4-7-11 ..... Rig up.
Tom David's No. 1 Smith, 460 ft. N, 200 ft. W, SE cor. SE SE, Sec. 27-8-10 ..... Rig up.
Franks et al's No. 1 Hays, 200 ft. N, 300 ft. E, SW cor. SE, Sec. 22-8-11 ..... Rig up.
Lide et al's No. 1 Ponder, 990 ft. N, 990 ft. W, C, Sec. 15-7-11 ..... Drlg. 1,800 ft.
Lohman & Walker's No. 1 Hubley, 330 ft. N, 330 ft. W, SE cor. SE NE, Sec. 21-7-11 ..... S.D. 2,300 ft.
Lohman et al's No. 1 Wyatt Lbr. Co., 150 ft. S, 330 ft. E, NW cor. NE SW, Sec. 18-4-11 ..... Rig up.
Longoria et al's No. 1 Belton, 330 ft. S, 330 ft. E, C, NE, Sec. 31-9-13 ..... Rig up.
Loring Oil Co.'s No. 1 Garner, 270 ft. N, 300 ft. E, SW cor. NW NE, Sec. 4-7-11 ..... Drlg. 2,270 ft.
Magnolia Pet. Co.'s No. 1 Glauque, 484 ft. N, 390 ft. E, SW cor. NW SW, Sec. 26-7-14 ..... Drlg. sandy lime 3,462 ft.
McDaniels & Lieber's No. 2 Batson, 480 ft. S, 220 ft. E, NW cor. SW SE, Sec. 16-8-12 ..... S. D. 2,136 ft; waiting for 6-in.
Merritt et al's No. 1 La. Long Leaf Lbr. Co., S½ NE NE, Sec. 33-8-11 ..... Rig up.
C. D. Neff, trustee's No. 1 Turner, 1,170 ft. S, 150 ft. W, NE cor. NW, Sec. 4-7-11 ..... Drlg. 2,440 ft.
Paramount O. & G. Co.'s No. 1 Woolems, 330 ft. N, 330 ft. W, SE cor. NE NW, Sec. 11-6-12 ..... Cmtd. 6-in. 2,310 ft.
Pelican Nat. Gas Co.'s No. 4 La. Long Leaf Lbr. Co., 300 ft. S, 300 ft. E, NW cor. NW SW, Sec. 4-7-11. ... W.O.S.R; 2,557 ft.
Pelican Nat. Gas Co.'s No. 5 La. Long Leaf Lbr. Co., 200 ft. S, 200 ft. W, NE cor. NW SW, Sec. 4-7-11. ... Rig up.
D. H. Riddick's No. 1 Scretchfield, 400 ft. E, 400 ft. N, SW cor. NW SE, Sec. 18-9-12 ..... S.D. 3,280 ft.
H. T. Stacey et al's No. 1 Polly, NE cor. NE NE, Sec. 18-8-12 ..... Rig up.

The Texas Co.'s No. 1 Largent, 365 ft. E, 315 ft. N, SW cor., Sec. 24-8-12 ..... Rig up.
Toteco Oil Co.'s No. 1 La. Long Leaf Lbr. Co., 325 ft. S, 100 ft. W, NE cor. NW, Sec. 18-6-12 ..... Reaming to bottom; T.D. 4,077 ft.
Wilson & Son's No. 1 Ganby-Garrett, NW SW, Sec. 4-5-12 ..... Drlg. 980 ft.

TENSAS PARISH

Stoval Drlg. Co.'s No. 1 Miller, NE SW, Sec. 18-10-10..... Arranging to plug back to 700 ft. to test gas show; T.D. 1,560 ft.
A. R. Willis et al's No. 1 Currey, 1,320 ft. S, 1,320 ft. E, NW cor., Sec. 39-11-12 ..... D.S. test 2,780 ft; S.W. and show gas; W.O; T.D 2,780 ft.

WEBSTER PARISH

Coyle trustees' No. 1 Frazer, 200 ft. N, 200 ft. E, SW cor. NE SE, Sec. 27-23-11 ..... Derrick.
J. P. Evans et al's No. 1 Crichton Co., NE cor. NW NE, Sec. 31-18-8 ..... Drlg. 2,450 ft.

WEST CARROLL PARISH

Ark.-La. P. L. Co.'s No. 1 Griffith, 660 ft. S, 660 ft. W, NE cor. NE NW, Sec. 17-22-10 ..... Cmtd. 15½-in. 158 ft; drlg. 1,320 ft.

ARKANSAS

CHICOT COUNTY

H. R. Smith's No. 1 Lytle, 660 ft. N, 660 ft. E, C, Sec. 31-18-3 ..... Coring 2,880 ft.

CLAY COUNTY

S. C. Jeffries, trustee's No. 1 Underwood, 510 ft. N, 350 ft. W, C, NW SE, Sec. 4-20-8 ..... Arranging to cmt. 10-in. 240 ft.

CLEBURNE COUNTY

Cosden Oil Co. of Ark.'s No. 1 Donophan, 100 ft. S, 660 ft. E, NW cor. SW SE, Sec. 19-9-10 ..... Fishing tools 4,360 ft.
Donnelly-Craver, et al's No. 1 Donophan Lbr. Co., SE cor. NW, Sec. 23-11-9 ..... S.D. repairing rig; T.D. 3,410 ft.

COLUMBIA COUNTY

S. Y. Dorfman et al's No. 1 Merritt, 923 ft. S, 660 ft. W, NE cor. SE NW, Sec. 25-19-22 ..... Top Arkadelphia 1,763 ft; top Nacatoch 1,861 ft; T.A. 2,803 ft.

FRANKLIN COUNTY

Red Bank Oil Co.'s No. 1 Edtin, SW cor., Sec. 33-10-26... Fishing tools 3,750 ft; cored.

GARLAND COUNTY

Givens et al's No. 1 Garrett, 660 ft. S, 660 ft. W, C, Sec. 1-3-19 ..... Waiting on bailing line; T.D. 3,790 ft.

HOT SPRINGS COUNTY

Anisman et al's No. 1 Hinson est., NE NE, Sec. 19-4-16... S.D; title work.
John Watkins' No. 1 Cunningham (was J. R. Lockhart's), 285 ft. S, 285 ft. W, NE cor., Sec. 11-5-16; (reported in Grant County in error) ..... Derrick.

LINCOLN COUNTY

B. F. Thompson, trustee's No. 1 McGhee, 330 ft. S, 150 ft. W, C, Sec. 8-8-7 ..... Rigging up.

LITTLE RIVER COUNTY

A. L. Buck's No. 1 Greason, NW NW, Sec. 25-12-32 ..... S.D. 2,502 ft.

LOGAN COUNTY

J. H. Flowers' No. 1 J. H. White, Sec. 13-6-26 ..... U.R. 5 3-16-in. 3,570 ft; T.D. 3,610 ft.

MADISON COUNTY

J. W. Baxter's No. 2 Hallem, C, Sec. 17-16-26 ..... Did not cmt. 6-in. 50 ft; drlg. slate 175 ft.

MILLER COUNTY

East Texas O. & Gas Co.'s No. 1 Harvey, 500 ft. E, 300 ft. S, NW cor., Sec. 2-15-26 ..... Drlg. 812 ft.
E. & F. Oil Co.'s No. 1 E. L. Beck, 200 ft. S, 200 ft. E, NW cor. SW, Sec. 36-15-26 ..... D.S. test 2,805-11 ft. dry; cmtd. 6⅝-in. 2,799 ft; C.D. 2,807 ft.
Fitzwater et al's No. 1 Beck, 200 ft. N, 200 ft. W, SE cor. SW SE, Sec. 33-15-26 ..... Derrick.
Lenz et al's No. 2 Johnson, SE cor., Sec. 24-15-16..... D.S. test 2,920 ft; S.W. mud and oil; arranging cmt. 6⅝-in.
Salzer & McRae's No. 1 Rose, SW cor. NE NW, Sec. 9-16-26 ..... Derrick.

OUACHITA COUNTY

Belmont et al's No. 1 Buck, SE cor. SE SW, Sec. 16-15-17 Cored sand showing oil 2,726-30 ft; arranging D.S. test.
Copenhaven et al's No. 1 Elliott, Sec. 11-15-17 ..... Began drlg. Oct. 5; drlg. 50 ft.
C. W. Fierson's No. 1 Haynes, 1,297 ft. N, 996 ft. W, SE cor., Sec. 9-17-3 ..... Top Monroe gas rock 2,462 ft; D. S. test 2,433 ft; failed; cmtd. 6-in.; T.D. 2,466 ft.
Graves Bros.' No. 1 Walker, 350 ft. N, 280 ft. E, SW cor., Sec. 9-14-18 ..... D.S. test 1,845-61 ft; 1 joint oil and mud; cmtd. 6⅝-in. 1,845 ft; T.D. 1,861 ft.
A. B. Turner, trustee's No. 1 Dave Brown, 220 ft. N, 220 ft. E, SW cor., Sec. 23-15-18 ..... D.S. test 2,172-78 ft; 55 ft. mud; T.D. 2,183 ft.

PHILLIPS COUNTY

Mahon interests' No. 1 Mannheimer (no check), Sec. 15-1s-1e ..... Began drlg. Sept. 30; drlg. 200 ft.

PIKE COUNTY

H. R. Henderson's No. 1 Tilyou, 660 ft. W, 500 ft. S, NE cor. NE SE, Sec 26-8-14 ..... Drlg. 1,270 ft.

POPE COUNTY

Ark.-La. P. L. Co.'s No. 2 McFaddin, 685 ft. N, 485 ft. W, SE cor. NE SW, Sec. 15-9-21 ..... Drlg. black shale 723 ft.

SCOTT COUNTY

Arkansas Valley Gas Co.'s No. 1 Turner, C SE, Sec. 27-5-30 ..... Location.
Heavener O. & G. Co.'s No. 1 Riser, Sec. 36-4-26 ..... Fishing tools 1,530 ft.

SEBASTIAN COUNTY

Lavaca O. & G. Co.'s No. 1 Davis, C NW NE, Sec. 29-8-30 ..... Location.

UNION COUNTY

S. B. Hickman's No. 1 Hogg, 330 ft. S, 150 ft. E, NW cor. SE SE, Sec. 35-16-17 ..... Drlg. 2,540 ft.
H. L. Hunt's No. 1 Swilly, 330 ft. S, 330 ft. W, NE cor., Sec. 28-16-16 ..... Began drlg. Oct. 4; cmtd. 10-in. 100 ft.
Marine Oil Co.'s No. 2-B Thompson, Sec. 10-18-13 ..... Location.
Marine Oil Co.'s No. 1-F Winn, Sec. 10-18-13 ..... Hole full fluid. 50% S.W; waiting on air; T.D. 3,604 ft.
Modisette Drlg. Co.'s No. 4 Union Sawmill, 330 ft. W, 300 ft. N, SE cor., Sec. 14-18-14 ..... Location.
Oil Field Corp.'s No. 1 Simmons, 330 ft. S, 330 ft. E, NW cor., Sec. 13-18-13 ..... Rig up.

VAN BUREN COUNTY

Glenn Kohle et al trustee's No. 1 Scalan, 200 ft. S, 200 ft. W, NE cor. SE NW, Sec. 5-19-13 ..... S.D. 50 ft.

WASHINGTON COUNTY

Delbert & Graves' No. 1 Cunningham, Sec. 14-15-32 ..... S.D; W.O. 602 ft.
C. H. Willoughby's No. 1 Jones, Sec. 34-16-30 ..... U.R. 5 3/16-in. 1,665 ft; T.D. 1,697 ft.
Lincoln Leaseholding Synd.'s No. 1 Lincoln, Sec. 30-15-32. U.R. 8-in. to T.D. 1,500 ft.
H. H. Taylor et al's No. 1 Runny, C NE SW, Sec. 1-13-29. S.D. for csg. 1,165 ft; (C.D.).

YELL COUNTY

Tegmeier & Luckett's No. 1 Falcon, Sec. 36-7-21 ..... Fishing tools 5,710 ft.

EAST TEXAS

BOWIE COUNTY

Joe Burnham et al's No. 1 G. W. Burnett, 150 ft. W, 400 ft. S, NE cor. G. W. Burnett 76 ac., in W. H. Janes Sur ..... S.D. wtr, 1,110 ft.
Maud-Redwater Oil Co.'s No. 1 Merritt, 175 ft. N, 175 ft. E, SE cor. G. W. Hardige 100-ac. tract on Floyd Merritt tract in Y. S. McKinney Sur. ..... Derrick.
Lee Timberlake's No. 1 Tidwell, 2,800 ft. N, 300 ft. W, SE cor., Jos. Eskell Sur. ..... Coring shale 2,830 ft; D.S. test 2,695-2,730 ft; 21 fourbles S.W; S.D. 3,008 ft.

CAMP COUNTY

McDonald Bros.' No. 1 Tillery, 150 ft. E, 450 ft. S, NW cor. 127-ac. tr., in J. H. Murphy Sur ..... Location.

CASS COUNTY

Phillips Pet. Co.'s No. 1 J. R. Olds, 300 ft. N, 170 ft. E, SW cor., J. A. Stephenson Sur ..... Rig up.
John C. Rogers' No. 1 I. E. Lanier, 573 ft. N, 879 ft. W, SE cor. Lanier 86 acres in K. E. Welborn Sur ..... Coring sand shale 1,010 ft.

MARION COUNTY

W. D. Chew's No. 1 Fee, 2,350 ft. W, 1,275 ft. N, SE cor., W. J. Hamilton Sur ..... D.S. test 2,532 ft; dry; drlg. 2,610 ft.
P. E. Hussey's No. 1 A. A. Trammell, Chas. Lockhart Sur ..... S.D. wtr. 1,334 ft.

RED RIVER COUNTY

D. M. Buffington's No. 1 Hossler, E. Hughhart Sur ..... S.D. 2,865 ft.
Johnson Pet. Co.'s No. 2 Randolph, Edw. Dean Sur ..... Swedging; 2 jts. collapsed 8-in. arranging to cement 6⅝-in. and packer 2,182 ft.

SABINE COUNTY

Benedum & Trees Oil Co.'s No. 1 Nona Mills Lbr. Co., Jas Mason Sur ..... Drlg. chalky lime 3,348 ft.

SHELBY COUNTY

Chapparell Oil Co.'s No. 2 Holt, Matthew Moore Sur. .... T.A. hard lime 3,350 ft.
G. R. Ridgway's No. 1 G. D. Parker, 4,980 ft. E, 750 ft. N, SW cor., Jessie McKelvey Sur ..... Rig up.

ALCORN COUNTY

Alcorn Pet. Co.'s No. 1 Matthews, SE cor., Sec. 14-2s-7e.. Fishing 6-in. and tools 2,392 ft; T.D. 2,735 ft.

ATTALA COUNTY

K. A. March's No. 1 H. A. Moore, 500 ft. W, 330 ft. S, NE cor. SE NW, Sec. 2-15-5e ..... Location.

CLAY COUNTY

Ohio Oil Co.'s No. 1 Cantrell, NE cor., Sec. 16-15-5 ..... Cmtd. 13⅜-in. 1,389 ft; gumbo and sand.

CHICKASAW COUNTY

Hightower & Golson's No. 1 Flemming, NE cor., Sec. 20-13-3 ..... Driving 8¼-in. to 1,495 ft; T.D. 1,436 ft.

HINDS COUNTY

Big Block Oil Co.'s No. 1 Southern Christian Institute, C N½ NE, Sec. 30-6-4 ..... S.D. 1,910 ft.
Hawkeye Gas Co.'s No. 1 Webster, NW cor. NE NW, Sec. 15-5-1e ..... Drlg. Wilcox 1,485 ft.
Jackson Oil Co.'s No. 1 Central Cotton Oil Co., NW cor. SW NW, Sec. 3-5-1e ..... Rig up.
Jackson O. & G. Co.'s No. 1 Capital Land & Inv. Co., Sec. 29-6-1e ..... Drlg 2,179 ft.
Dr. Barney Kennedy's No. 1 fee, 150 ft. E, 200 ft. N, SW cor. NE NE, Sec. 34-6-1e ..... Location.
Love Pet. Co.'s No. 1 Maley, SE cor. NW, Sec. 15-5-1e ... Top Midway 2,387 ft; top chalk 2,487 ft. and cmtd. 6⅝-in; T.D. 2,490 ft.
Love Pet. Co.'s No. 1 Morton Lbr. Co., 100 ft. W, 200 ft. N, SE cor. SW SW, Sec. 34-6-1e..... Derrick.
Miss. Pet. Co.'s No. 1 Baptist Orphanage, 175 ft. E, 130 ft. N, SW cor. SE SE, Sec 28-6-1e ..... Drlg. lime 2,369 ft.
Miss. Pet. Co.'s No. 1 Solvent Investment Co., NE cor. NE SW SW, Sec. 14-5-1w ..... Top hard lime 2,272 ft.
Miss.-Tex. Oil Co.'s No. 1 Negro Fair Assn., SW cor. NW SE, Sec. 28-6-1e ..... S.D. 1,902 ft; title work.
Mrs. Reeder et al's No. 1 State, SE cor. NW NW, Sec. 25-6-1e ..... W.O; T.D. 2,905 ft.
Tri-State O. & G. Co.'s No. 1 Wilson, SW cor. SE NE, Sec. 23-6-1e ..... Derrick.
Universal Gas Co.'s No. 1 Sharbrough, SW cor. SE, Sec. 28-6-1e ..... Began drlg. July 29; S.D; W.O. 88 ft.

HUMPHRIES COUNTY

E. S. Steele et al's No. 1 C. B. Box, SE cor. SE NE, Sec. 25-14-4w ..... Set 12½-in. 60 ft; S.D.

LAUDERDALE COUNTY

Lauderdale O. & G. Co.'s No. 1 Lackey, 990 ft. S and E, NW cor. NE, Sec. 2-7-16 ..... Tested S.W. 3,252 ft; S.D. 3,420 ft.
Meridian O. & G. Co.'s No. 1 Hauser, Sec. 33-8-18 ..... Fishing 4 fourbles; D.S; T.D. 2,826 ft.
J. R. Smith Oil Co.'s No. 1 C. F. Craig, Sec. 2-16-14..... Derrick.

LAFAYETTE COUNTY

Banks-Good et al's No. 1 May, 113½ rds. S, 26 rds. E, NW cor. SW, Sec. 22-10-1w ..... Derrick.

LINCOLN COUNTY

Lincoln O. & G. Co.'s No. 1 Pat Case, NE cor. NE, Sec. 21-3-6 ..... S.D; W.O. 2,231 ft.

MADISON COUNTY

Barney Kennedy et al's No. 1 Raymond, 300 ft. E, 1,800 ft. N, SW cor., Sec. 32-7-2e ..... Cmtd. 12½-in. 706 ft.

MONROE COUNTY

Amory Dev. Co.'s No. 1 Bouriand, Sec. 2-13-19 ..... Resumed operations Oct. 2; recovered lost bailer; drlg. 2,912 ft.
Amory Pet. Co.'s No. 1 Hall, Sec. 8-13-19 ..... Shot 2,402-18 ft; small S.O; arranging to shoot 2,387-95 ft.
Associated Oil Co.'s No. 1 School, SW cor. SW SE, Sec. 16-15-17 ..... Began drlg. Aug. 26; S.D. 32 ft.
Park Bowser et al's No. 1 Cowart, second hole, Sec. 2-12-19 ..... S.D. 30 ft.

RANKIN COUNTY

R. A. Moore et al's No. 1 Interior Lbr. Co., Sec. 28-6-1e.. S.D. 900 ft.
Love Pet. Co.'s No. 1 Moore (was Interior Oil Co.'s), 660 ft. N, 660 ft. W, SE cor. NW NW, Sec. 28-6-2e.. S.D. 900 ft.

WARREN COUNTY

El Dorado Oil Co.'s No. 1 Dornbush, Sec. 8-18-15 ..... S.D. 2,475 ft; 2,350 ft. D.S. in hole; W.O.

WINSTON COUNTY

Miss. Drlg Co.'s No. 1 Scarbrough, NW cor., Sec. 15-13-14 Rig up.

YALOBUSHA COUNTY

Carter Oil Co. and J. W. Collett's No. 1 Blackmur, 330 ft. S, 990 ft. W, Sec. 14-11-4..... Fishing junk 2,260 ft; T.D. 2,436 ft.

YAZOO COUNTY

Amerada Pet. Corp.'s No 1 Doherty, SW SW, Sec. 24-12-2. Drlg. sandy lime 5,133 ft.

ALABAMA

LAMAR COUNTY

Griggs & Knapp's No. 1 Wefel, Sec. 25-12-14 ..... T.A. 1,740 ft.

LAUDERDALE COUNTY

A. D. Morton et al's No. 10 O'Neal est., Sec. 8-2s-13w ... Cmtd. 12½-in. 125 ft; drlg. hard lime 905 ft.

MARION COUNTY

Hobson et al's No. 1 John Clark, SE, Sec. 29-11-14 ..... Derrick pattern.

WASHINGTON COUNTY

S. A. Hobson's No. 1 Hobson Bros., Sec. 9-8-2 ..... S.D; W.O; flow at 1,450 ft.
S. A. Hobson's No. 1 Wilson, Sec. 27-7-1 ..... Fishing bailer; T.D. 881 ft.
Oscar Brown's No. 2 Land & Cotton Co., Sec. 25-3-2w.... Drlg. 700 ft.

LOUISIANA-ARKANSAS PROVEN AREAS

(Continued from Page 50)

CADDO PARISH—GREENWOOD

Calatex O. & G. Co.'s No. 1 Edgar, 1,460 ft. S, 1,900 ft. E, NW cor., Sec. 17-16-16 ..... Location.
Calatex O. & G. Co.'s No. 1 McAnn-Alfred, 1,810 ft. S, 970 ft. E, NW cor., Sec. 17-16-16 ..... Location.

Calatex O. & G. Co.'s No. 1 Hudson, 2,395 ft. N, 660 ft. E, SW cor., Sec. 8-16-16 ..... D.S. test 2,980 ft; 3,000,000 ft. gas; cmtd. 6-in. 2,807 ft.

DE SOTO PARISH—HOLLY

Standard Oil Co.'s No. 4-A Farmer, 330 ft. S, 330 ft. E, NW cor. NE NW, Sec. 5-13-13 ..... Began drlg. Oct. 3; cmtd. 10-in. 83 ft; drlg. 1,385 ft.

CADDO PARISH—OIL CITY

The Texas Co.'s No. 73 Levee Board, 1,642 ft. E, 780 ft. N, SW cor. SW SE, Sec. 27-21-16 ..... Location.

The Texas Co.'s No. 74 Levee Board, 1,600 ft. S, 200 ft. W, NE cor., Sec. 33-21-16 ..... Derrick.

The Texas Co.'s No. 75 Levee Board, 2,450 ft. S, 224 ft. W, NE cor., Sec. 33-21-16 ..... Derrick.

CADDO PARISH—PINE ISLAND

Shreveport Oil Corp.'s No. 1-A Muslow, 150 ft. S, 150 ft. E, NW cor., Sec. 32-21-15 ..... Blew out 2,126 ft; estimated 5,000,000 ft. gas, 3,000 bbl. S.W; killed; arranging to set 4½-in.

CLAIBORNE PARISH—SUGAR CREEK

Triangle Drlg. Co.'s No. 1 Brownfield, 660 ft. S, 660 ft. E, NW cor. NE, Sec. 6-19-5 ..... Rig up.

Triangle Drlg. Co.'s No. 1 J. W. Stevenson, 670 ft. N, 665 ft. W, SE cor. SW SE, Sec. 6-19-5 ..... Began drlg. Oct. 3; drlg. 1,195 ft.

LA SALLE PARISH—URANIA

Montugu Oil Co.'s No. 9 Zenoria Lbr. Co., 660 ft. W, 200 ft. S, NE cor., Sec. 10-9-1e ..... Location.

MOREHOUSE PARISH

Bahan & Bahan's No. 4 Feazel, 900 ft. W, 330 ft. S, NE cor., Sec. 2-20-4 ..... Location.

Grecian Bend Gas Co.'s No. 1 J. D. Sandidge et al, 600 ft. W, 1,980 ft. N, SE cor. NE, Sec. 2-20-4 ..... Location.

Moody-Seagraves Gas Co.'s No. 1 Fisher, 660 ft. E, 3,814 ft. N, SW cor., Sec. 34-21-5 ..... Rig up.

Ouachita Nat. Gas Co.'s No. 2 Cole, 660 ft. S, 613 ft. W, NE cor., Sec. 13-20-4 ..... Rig up.

Ouachita Nat. Gas Co.'s No. 7 Sandidge, 1,047 ft. N, 694 ft. E, SW cor. NW, Sec. 24-20-4 ..... Cmtd. 6-in. 2,131 ft.

OUACHITA PARISH

Grecian Bend Gas Co.'s No. 1 Guthrie (no check), Sec. 49-20-4 ..... Began drlg. Sept. 25; cmtd. 12-in. 120 ft; 8-in. 804 ft; 6-in. 2,125 ft.

Jordan Drlg. Co.'s No. 7 Cole, 265 ft. S, 1,459 ft. W, NE cor., Sec. 49, in Sec. 50-18-4 ..... Location.

Jordan Drlg. Co.'s No. 1 School, 216 ft. S, 244 ft. W, NE cor. NW, Sec. 16-18-4 ..... Derrick.

Pipes & Mack's No. 2 Union Gas Products Co., 296 ft. W, 528 ft. N, SE cor. SW, Sec. 7-18-5 ..... Location.

United Carbon Co.'s No. 6 Spade, 1,180 ft. S, 140 ft. E, NW cor., Sec. 27-19-4 ..... Location.

RICHLAND PARISH

W. C. Feazel's No. 1 R. B. Simon, 2,406 ft. W, 2,020 ft. S, NE cor., Sec. 11-16-6 ..... Rig moved; derrick.

Franklin O. & G. Co.'s No. 1 Thomson, 660 ft. N, 165 ft. W, SE cor. NE, Sec. 14-16-6 ..... Location.

Greenwood Prod. Co.'s No. 1 Boughton, 1,980 ft. E, 660 ft. N, SW cor., Sec. 33-16-6 ..... Cmtd. 6-in. 2,300 ft.

Palmer Corp.'s No. 1-B Boykin, 177 ft. S, 787 ft. E, C, Sec. 33-17-6 ..... Rig up.

Palmer Corp.'s No. 1 Rhymes-Earle, 1,980 ft. S, 1,394 ft. W, NE cor., Sec. 36-17-5 ..... Drlg. shale and boulders 2,281 ft.

Palmer Corp.'s No. 10 Rhymes-England, 1,245 ft. S, 700 ft. W, NE cor., Sec. 7-16-6 ..... Reaming to set 6-in; T.D. 2,300 ft.

Palmer Corp.'s No. 11 Rhymes-England, 2,033 ft. W, 660 ft. S, NE cor. NE, Sec. 12-16-5 ..... Cmtd. 6-in. 2,300 ft.

Southern Carbon Co.'s No. 1 J. A. Clements, 1,320 ft. S, 1,980 ft. W, NE cor., Sec. 10-16-6 ..... Derrick.

Southern Carbon Co.'s No. 1 G. Harris, 10 ft. S, 660 ft. W, NE cor., Sec. 10-16-6 ..... Drlg. shale and boulders 1,935 ft.

Southern Carbon Co.'s No. 1-C Hemler, 1,164 ft. S, 888 ft. W, NE cor., Sec. 14-16-6 ..... Location.

Southern Carbon Co.'s No. 2-C M. L. McCoy, 1,880 ft. N, 5,024 ft. E, SW cor., Sec. 1-16-6 ..... Cmtd. 6-in. 2,285 ft.

Southern Carbon Co.'s No. 7 F. B. and E. A. Sartor, 2,540 ft. S, 660 ft. E, NW cor., Sec. 17-16-7 ..... Location.

Southern Carbon Co.'s No. 1-C Thomason, 1,980 ft. N, 1,400 ft. W, SE cor., Sec. 14-16-6 ..... Derrick.

United Carbon Co.'s No. 1 Boughton, 3,244 ft. E, 4,693 ft. N, SW cor., Sec. 1-16-6. ..... Drlg. 2,275 ft.

United Carbon Co.'s No. 1 L. Williams, 1,980 ft. S, 1,980 ft. W, NE cor., Sec. 33-16-6 ..... Fishing reamer; T.D. 2,285 ft.

SABINE PARISH—PLEASANT HILL

F. A. Bartlett, Jr.'s No. 1 Logan, 200 ft. S, 200 ft. E, NW cor., Sec. 27-10-12 ..... Drlg. 2,400 ft.

A. C. Glassell's No. 1 Logan Oil Co., 300 ft. E, C, Sec. 23-10-13 ..... S.D. wtr; T.D 1,710 ft.

SABINE PARISH—ZWOLLE

Ark. Fuel Oil Co.'s No. 1 Susie Russell, 330 ft. N, 330 ft. E, SW cor. E½ NW NE, Sec. 26-8-12 ..... Dry 2,461 ft; arranging to test 2,600 ft.

Tom Davis' No. 1 Holliday (was T. D. Allison's), Sec. 31-8-12, Zwolle Townsite ..... S.D. wtr. 1,350 ft.

F. M. Hood's No. 1-B Winston (was No. 2), 700 ft. E, 425 ft. S, NW cor. Sec. 31-8-12, Zwolle Townsite .... S.D. 1,065 ft.

Dixie Oil Co.'s No. 1 Parrott, 330 ft. N, 330 ft. E, SW cor. SE NE, Sec. 26-8-12 ..... Cmtd. 10-in. 100 ft; drlg. 994 ft.

Dixie Oil Co.'s No. 1 Tatum, 330 ft. N, 330 ft. E, C, Sec. 26-8-12 ..... Began drlg. Oct. 6; cmtd. 10-in. 100 ft.

R. L. Gay's No. 1 Peterson (was Posey et al's), Blk. 16, Zwolle Townsite, Sec. 31-8-12 ..... Drlg. 1,008 ft.

Ab Jones et al's No. 1 Ferguson, 330 ft. N, 330 ft. W, SE cor. NE SW, Sec. 33-8-12 ..... Rig up.

Lacey Burkett Co.'s No. 1 Danna, 316 ft. E, 200 ft. S, C, Sec. 26-8-12 ..... Fishing liner; T.D. 2,412 ft.

Loring Oil Co.'s No. 12 Bowman-Hicks, 330 ft. S, 345 ft. W, NE cor. SE NE, Sec. 33-8-12 ..... W.O.S.R. 2,650 ft.

Loring Oil Co.'s No. 1 Middleton, 200 ft. E, 200 ft. S, NW cor. NE SE, Sec. 26-8-12 ..... Rig up.

Loring Oil Co.'s No. 2 Sabine Lbr. Co., 1,430 ft. E, 340 ft. N, C, Sec. 34-8-12 ..... 100 ft. oil in hole; W.O.S.R; T.D. 2,600 ft.

Lyon et al's No. 1 Neely (was No. 1 Williams), 330 ft. N, 330 ft. W, SE cor. SW SE, Sec. 32-8-11 ..... Cmtd. 10-in. 1,700 ft.

W. D. Perritt et al's No. 1 Elliott, 150 ft. N, 150 ft. E, SW cor. SW SE SW, Sec. 30-8-12 ..... W.O.S.R; 1,300 ft. oil; T.D. 2,356 ft.

Pugh-Hickman Drlg. Co.'s No. 1 Sabine Lbr. Co., 350 ft. N, 350 ft. E, SW cor. NW NE, Sec. 34-9-12..... Rig up.

Wheatcroft et al's No. 1 Sabine Lbr. Co., SW NE, Sec. 31-8-12 ..... S.D. 2,495 ft.

SABINE PARISH—BLUE LAKE

R. L. Gay's No. 8 Bowman-Hicks, Sec. 18-7-13..... Recmtd. back to 2,492 ft; old T.D. 2,552 ft.

UNION PARISH

Bahan & Bahan's No. 2 Tanner, 3,300 ft. N, 1,980 ft. W, SE cor., Sec. 19-22-4 ..... Rig up.

Industrial Gas Co.'s No. 5 Grayling Lbr. Co., 660 ft. E, 660 ft. S, NW cor. NE, Sec. 28-21-4 ..... Rig up.

Interstate Nat. Gas Co.'s No. 1 J. M. Edwards, 1,980 ft. W, 660 ft. S, NE cor., Sec. 11-21-3 ..... Drlg. 2,126 ft.

WEBSTER PARISH—SAREPTA AND SHONGALOO

H. M. Jones Drlg. Co.'s No. 1 Womble, 360 ft. S, 200 ft. E, NW cor. SW, Sec. 1-22-11 ..... Derrick.

Liggett et al's No. 2 Slack, 720 ft. E, 150 ft. N, SW cor. SE SE, Sec. 36-23-11 ..... S.D. 2,618 ft.

Magnolia Pet. Co.'s No. 2 Gardner, 100 ft. S, 145 ft. W, NE cor. SE NW, Sec. 1-22-11 ..... Swbng. to test 2,738 ft.

ARKANSAS

JOHNSON COUNTY

Ark.-La. P. L. Co.'s No. 1 Hudson et al, 660 ft. N, 545 ft. E, SW cor. SE NE, Sec. 14-10-24 ..... Cmtd. 15½-in. 240 ft; drlg. 1,170 ft.

Ark.-La. P. L. Co.'s No. 1 Mattie Kelly, 330 ft. S, 657 ft. E, NW cor. SW SW, Sec. 14-10-24..... Drlg. hard sand 1,430 ft.

Conn Grable's No. 1 Hoeing, 720 ft. N, 590 ft. W, SE cor., Sec. 20-9-5 ..... S.D. 2,238 ft.

OUACHITA COUNTY—SMACKOVER

L. H. Hamilton's No. 3 Doyle, 100 ft. E, 400 ft. N, SW cor. SE SE, Sec. 23-15-16 ..... Began drlg. Sept. 24; cmtd. 10-in. 40 ft; S.D.

W. J. Thomas' No. 1 Usserey & Arnold, 200 ft. N, 200 ft. W, SE cor. NW, Sec. 36-15-15 ..... Began drlg. Oct. 5; cmtd. 12-in. 150 ft.

SEBASTIAN COUNTY

Mansfield Gas Co.'s No. 14 Fee, Lot 10, Sec. 1-4-31 ..... Drlg. shale 1,410 ft.

Ozark Nat. Gas Co.'s No. 10 Weaver, 660 ft. N, 660 ft. W, SE cor. SE NE, Sec. 27-8-30 ..... Straightening hole; T.D. 2,640 ft.

Ozark Nat. Gas Co.'s No. 1 Bates, C SE NW, Sec. 28-8-30 Drlg. sand 2,800 ft.

UNION COUNTY—CHAMPAGNOLLE

Ohio Oil Co.'s No. 10 Crain, 330 ft. S, 330 ft. W, NE cor. SE SW, Sec. 1-17-14 ..... Derrick.

Ohio Oil Co.'s No. 4 R. Pumphrey, 330 ft. S, 330 ft. W, NE cor. NE NW, Sec. 12-17-14. ..... Drlg. 2,880 ft.

UNION COUNTY—EL DORADO

Malloy & Co.'s No. 7 Burns, SW cor. NW NW, Sec. 31-17-15 ..... Cmtd. 8¼-in. 2,148 ft.

Rice Drlg. Co.'s No. 1 Watley, 150 ft. S, 150 ft. E, NW cor. SW, Sec. 7-17-15 ..... Reported abd. 92 ft. Apr. 30, 1930; arranging to resume drlg.

UNION COUNTY—SMACKOVER

J. E. Crosbie, Inc.'s No. 1 G. L. Murphy, 300 ft. N, 300 ft. W, SE cor. SW NW, Sec. 13-16-16 ..... Reaming to bottom; T.D. 2,588 ft.

EAST TEXAS

HARRISON COUNTY

Calatex O. & G. Co.'s No. 6 Agurs, 755 ft. N, 699 ft. W, Mile Post 27, in J. Womack Sur. ..... Location.

Shell Rock Pet. Co.'s No. 1 Oliver Dougherty, W. D. Burris Sur ..... S.D. brown chalk 3,520 ft.

HINDS COUNTY

Lefleur O. & G. Co.'s No. 1 Chadwick-Brown, 550 ft. S, 780 ft. W, NE cor., SW NW, Sec. 11-5-1e ..... Cmtd. 6⅝-in. 2,424 ft.

Cleve Love et al's No. 1 Ridgeway-McGee, 100 ft. W, 500 ft. S, C, Sec. 2-5-1e ..... Tested dry; little S.W. 2,488 ft; arranging to deepen.

PANOLA COUNTY

Ark.-La. P. L. Co.'s No. 2-A G. W. Brumble, 477 ft. W, 473 ft. S, NW cor. Jno. Womack Sur., in B. C. Jordan Sur ..... Cmtd. 9-in. 2,592 ft; drlg. lime

W. G. Banks et al's No. 1 C. O. Baldwin, 1,395 ft. W, 1,362 ft. S, NE cor. Baldwin 290 ac. in Hampton West Sur. ..... Location.

S. E. Bell et al's No. 1 Burnett Lbr. Co., C. S. B. Hendricks Sur ..... Cmtd. 8⅝-in. 2,047 ft.

Creighton and Hart's No. 1 Greeny-Kyle, C. Greeny-Kyle 60 ac., Jas. Tippett Sur ..... Top chalk 1,445 ft; drlg. 1,965 ft.

Knox et al's No. 1 Dunham (was Jackson et al's), 150 ft. W, 150 ft. N, SE cor. M. I. Dunham 29 ac., in Chas. Haley Sur ..... S.D; W.O. 2,400 ft.

Tex.-La. Prod. Co.'s No. 1 O. M. Lawrence, Harrison Davis Sur ..... Drlg. 2,808 ft.

Doris Thomason's No. 15 Crenshaw, 1,992 ft. S, 2,305 ft. E, SW cor., Jno. Womack Sur., in B. C. Jordan Sur... Derrick.

RANKIN COUNTY

Millstein O. & G. Corp.'s No. 1 Hartfield, 1,000 ft. W, 62 ft. N, SE cor. NE, sec. 12-5-1e ..... Waiting on string 5 3/16-in. to set inside 6⅝-in. stuck at 2,060 ft; T.D. 2,361 ft.

Dr. S. D. Raymond's No. 1 Graves, 1,810 ft. N, 3,210 ft. W, SE cor., Sec. 12-5-1e ..... Derrick.

GULF COAST FIELDS AND WILDCATS

(Continued from Page 48)

Humble & Valley's No. 1-B Remmert ..... Building derrick.

Humble & Valley's No. 6 Saunders ..... Derrick.

Humble & Valley's No. 3 Sherrod ..... Rigging up.

Humble & Valley's No. 9 Thompson ..... Drlg. sand and shale 3,572 ft.

Humble & Valley's No. 11 Thompson ..... Derrick.

Humble & Valley's No. 4 Wilson ..... Drlg. sand and shale 3,376 ft.

Humble & Valley's No. 6 Woodley ..... Derrick.

Humble & Valley's No. 7 Woodley ..... Derrick.

Humble & Valley's No. 8 Woodley ..... Derrick.

Humble & Valley's No. 9 Woodley ..... Derrick.

Humble & Valley's No. 10 Woodley ..... Derrick.

Humble Oil & Ref. Co.'s No. 1 Hugo-Hagen ..... Drlg. sand 5,044 ft.

HUMBLE—HARRIS COUNTY

Cullen West's No. 5 Lee, south ..... Rig.

Houtex Prod. Co.'s No. 1 Burgess ..... No report.

LaRue trustee's No. 1 Crane, northwest ..... Derrick.

M. LaRue trustee's No. 1 Tuffly, northwest ..... Location.

Sun Oil Co.'s No. 14 Bender, west ..... No report.

Sun Oil Co.'s No. 15 Bender ..... Comp. flowing 150 bbls. 4,224 ft.

Sun Oil Co.'s No. 16 Bender ..... Derrick.

Sun Oil Co.'s No. 17 Bender ..... No report.

Sun Oil Co.'s No. 18 Bender ..... Derrick.

Sun Oil Co.'s No. 49 River, north ..... No report.

The Texas Company's No. 2 Atlantic & Gulf, east ..... Set screen 5,340 ft.

The Texas Company's No. 2 fee ..... Total depth 4,397 ft.; sidetracking.

The Texas Company's No. 25 House, northeast ..... Drlg. sticky shale and sand 4,406 ft.

The Texas Company's No. 43 Stevenson, east ..... Drlg. sand and boulders 2,345 ft.

E. M. Wilson's No. 5 Pickins ..... Comp. flowing 125 bbls. net oil 1,504 ft.

PIERCE JUNCTION—HARRIS COUNTY

Gulf Prod. Co.'s No. 2 Manchester Corp. ..... Rig.

Mike Kowin's No. 1 Jones fee, northwest ..... Drlg. gumbo and lime 3,220 ft.

Navarro Oil Co. and Texas Exploration Co.'s No. 20 Dooley ..... No report.

Rio Bravo Oil Co.'s No. 14-A Settegast ..... Shut down 5,045 ft.

Rio Bravo Oil Co.'s No. 20-A Settegast ..... Drlg. sandy shale 5,200 ft.

Elvin Tilton's No. 1 G. P. Co.-Jones fee ..... Comp. flowing 45 bbls. hourly 7/16-in. choke, sand 3,756-73 ft.

Warner-Quinlan's No. 1 Minchen ..... Comp. flowing 265 bbls. oil 4,136 ft.

BIG CREEK—FORT BEND COUNTY

Gulf Production Co.'s No. 61 Davis ..... Derrick.

Navarro Oil Co.'s No. 5 Davis ..... Drlg. shale 3,437 ft.

LOST LAKE—CHAMBERS COUNTY

Pure Oil Co.'s No. 5 Lost Lake ..... Fishing stuck drill stem 5,158 ft.

Pure Oil Co.'s No. 12 Lost Lake ..... Rigging up.

NASH—BRAZORIA COUNTY

Rycade Oil Corp.'s No. 27 Wisdom ..... Coring shale 5,613 ft.

SARATOGA—HARDIN COUNTY

Paggi Brothers' No. 16 McShane Fee ..... Comp. flowing 265 bbls. oil 4,130 ft.

Rio Bravo Oil Co.'s No. 92-A Cotton ..... Drlg. shale 630 ft.

GOOSE CREEK—HARRIS COUNTY

Humble Oil & Ref. Co.'s No. 78 Simms-Smith ..... Total depth 4,973 ft.; repairing rig.

SPINDLETOP—JEFFERSON COUNTY

Unity Oil Co.'s No. 101 McFaddin ..... No report.

Yount Lee Oil Co.'s No. 52 McFaddin (workover) ..... Drlg. sand 4,926 ft.

Yount Lee Oil Co.'s No. 113 McFaddin (workover) ..... To deepen 3,723 ft.
Yount Lee Oil Co.'s No. 142 McFaddin ..... Drlg. 4,500 ft.
Yount Lee Oil Co.'s No. 143 McFaddin ..... Drlg. gumbo and lime 3,804 ft.
Yount Lee Oil Co.'s No. 144 McFaddin ..... Drlg. shale and lime 2,132 ft.

NORTH DAYTON—LIBERTY COUNTY

Saxet Oil Co.'s No. 2 Davis ..... Drlg. gumbo 1,507 ft.
Saxet Oil Co.'s No. 3 Wilhite ..... Heaving shale 5,580 ft.; pulled in derrick.
Harrison Oil Co.'s No. 1 Gulf fee ..... Total depth 4,952 ft.; drlg. sidetracked hole 4,200 ft.
Harrison Oil Co.'s No. 4 Quintette (workover) ..... Old depth 4,120 ft.; rig up to deepen.

HIGH ISLAND—GALVESTON COUNTY

Gulf Prod. Co.'s No. 10 Smith ..... Sticky shale 5,023 ft.; drill stem stuck.
Marrs McLean's No. 19 Cade ..... Rig.

LIBERTY—LIBERTY COUNTY

Empire Gas & Fuel Co.'s No. 14 O'Brien ..... Derrick.

ORCHARD—FORT BEND COUNTY

Gulf Prod. Co.'s No. 25 Moore ..... Drlg. oil sand 4,056 ft.
Gulf Prod. Co.'s No. 26 Moore ..... Drlg. hard sand 3,512 ft.

HULL—LIBERTY COUNTY

The Texas Company's No. 3 Barrow ..... Waiting orders 3,986 ft.

PORT NECHES—ORANGE COUNTY

Gulf Prod. Co.'s No. 1 W. H. Starks ..... Drlg. sticky shale 6,304 ft.
The Texas Company's No. 2 Starks ..... Coring 5,422 ft.

CLAY CREEK—WASHINGTON COUNTY

Sun Oil Co.'s No. 4 Janner ..... Coring sand 2,696 ft.
Sun Oil Co.'s No. 1 Freeman ..... Spudded.

SOUR LAKE—HARDIN COUNTY

The Texas Company's No. 307 fee ..... Drlg. sticky shale 2,595 ft.

ESPERSON—LIBERTY COUNTY

Cranfill-Reynolds' No. 6 Davis ..... Location.
Cranfill-Reynolds' No. 9 Esperson ..... Rigging up to work over.
Cranfill-Reynolds Oil Co.'s No. 13 Esperson ..... Comp. pumping 150 bbls. 3,323 ft.
Cranfill-Reynolds Oil Co.'s No. 17 Esperson ..... Drlg. gumbo 2,240 ft.
Cranfill-Reynolds Oil Co.'s No. 5 Moores Bluff ..... Comp. flowing 125 bbls. 2,323 ft.
Cranfill-Reynolds Oil Co.'s No. 1 Vaydak (workover) ..... Total depth 7,592 ft.; milled out at 2,693 ft.; drlg. sidetracked hole 3,693 ft.
Yount Lee Oil Co.'s No. 3 Moores Bluff ..... Total depth 7,592 ft.; drlg. sidetracked hole 7,312 ft., hard sand.

HANKAMER—LIBERTY COUNTY

Gulf Prod. Co.'s No. 1 Ezzell ..... Total depth 4,425 ft.; drlg. sidetracked hole 3,738 ft.
Gulf Prod. Co.'s No. 9 Boyt ..... Drlg. shale 3,364 ft.

WEST COLUMBIA—BRAZORIA COUNTY

The Texas Company's No. 80 Hogg (workover) ..... Cemented casing 2,770 ft.

DE WALT—FORT BEND COUNTY

Humble Oil & Ref. Co.'s No. 11 Nelson ..... Drlg. sandy shale 2,899 ft.

BOLING—WHARTON COUNTY

C. S. Thomas' No. 1 Volney ..... Drlg. rock 250 ft.

REFUGIO—REFUGIO COUNTY

Benedum & Trees' No. 1 Rooke (workover) ..... Drlg. shale 6,172 ft.
Brookins et al's No. 1 Kay ..... Oil sand 3,705 ft.; to set casing.
Houston Oil Co.'s No. 1 Rooke ..... Sand and shale 4,720 ft.; making drill stem test.
Houston Oil Co.'s No. 2-A Fannie Heard ..... Rig.
Houston Oil Co.'s No. 1 City, Blk. 59 ..... Comp. flowing 50 bbls. 6,455 ft.
Houston Oil Co.'s No. 1 Doughty ..... Rigging up to deepen.
Houston Oil Co.'s No. 1 Tom Heard ..... Rigging up to deepen 5,470 ft.
Houston Oil Co.'s No. 1 O'Connor ..... Drlg. sand showing oil 5,913 ft.
Houston Oil Co.'s No. 1 Rose Lambert ..... Total depth 5,922 ft.; sidetracking 4,985 ft.
Houston Oil Co.'s No. 1-A Rose Lambert ..... Spudded.
Independent Oil & Gas Co.'s No. 1 Rose Lambert ..... Drlg. gas sand 5,672 ft.
Independent Oil & Gas Co.'s No. 6 Jerry Reilly (workover) ..... Sand and shale 7,618 ft.; to plug to gas sand 3,860 ft.
Independent Oil & Gas Co.'s No. 1 Mercy Academy, (workover) ..... Drlg. shale 6,186 ft.
Edwin Jones' No. 1 Mitchell ..... Drlg. shale 1,258 ft.
Larco Oil Co.'s No. 6 Strauch ..... Set 6⅝-in. casing 3,680 ft.
Luling Oil & Gas Co.'s No. 1 Talman, Blk. 104 ..... Drlg. lime 5,103 ft.
Luling Oil & Gas Co.'s No. 1 J. W. Kay ..... Standing 4,928 ft.
Luling Oil & Gas Co.'s No. 1 West ..... Drlg. plug 6,458 ft.
Mission Drilling Co.'s No. 1 Ben Shelton ..... Tested salt water 5,472 ft.; drlg. deeper.
Mission Drilling Co.'s No. 1 Moss-Heard, Blk. 11 ..... Drlg. sand and shale 7,278 ft.
Mission Drilling Co.'s No. 1 O'Brien (workover) ..... Standing 5,471 ft.
Mission Drilling Co.'s No. 1 Joe Shay ..... Total depth 5,477 ft.; drlg. 5,106 ft.
Moody-Seagraves Prod. Co.'s No. 1 Linney, Blk. 41 ..... Drlg. gumbo 2,826 ft.
Moody-Seagraves Prod. Co.'s No. 1 Linney, Blk. 42 ..... Drlg. sand and lime 4,292 ft.
Moody-Seagraves Prod. Co.'s No. 1 Rooke ..... Total depth 5,930 ft.; recemented 12½-in. casing 5,507 ft.
Moody-Seagraves Prod. Co.'s No. 1-A St. John ..... Sand 5,491-5,500 ft.; set 23 ft. screen; fishing swab.
Moody-Seagraves Prod. Co.'s No. 1 Strauch, Blk. 65 ..... Drlg. sand 6,114 ft.
Moody-Seagraves Prod. Co.'s No. 5 Morgan-O'Connor ..... Drlg. sandy lime 4,268 ft.
Moody-Seagraves Prod. Co.'s No. 6 Morgan-O'Connor ..... Location.
Nichols Oil Co.'s No. 1 Wood ..... Spudded.
Ed Price's No. 2 Mission River ..... Oil sand 3,657-65 ft.; set 12 ft. screen.
Pearson Properties, Inc.'s No. 1 Hornburg ..... Derrick.
Well Oil Co.'s No. 2 Terell ..... Shut down 4,621 ft.
Saxet Oil Co.'s No. 1 L. H. Johnson, Blk. 11 ..... Location.
Saxet Oil Co.'s No. 1 Fox heirs (workover) ..... Total depth 3,963 ft.; setting up larger rig.
Saxet Oil Co.'s No. 12 Clint Heard (workover) ..... Total depth 6,442 ft.; fishing 5,242 ft.
Sun Oil Co.'s No. 3 Rea ..... Location.
L. L. Smith's No. 1 Powers, Blk. 85 ..... Drlg. sticky shale 4,661 ft.
L. L. Smith's No. 1 Rodgers ..... Derrick.
Union Prod. Co.'s No. 10 Fannie Heard ..... Total depth 3,665 ft.; comp. estimated 800 bbls.
Union Prod. Co.'s No. 6 O'Brien ..... Derrick.
Union Producing Co.'s No. 3 Fox ..... Drlg. lime rock 967 ft.
Union Prod. Co.'s No. 5 Powers ..... Drlg. sand rock 1,178 ft.
Union Prod. Co.'s No. 5 Mitchell ..... Rig.

SOUTH LOUISIANA FIELDS
LOCKPORT—CALCASIEU PARISH

Union Sulphur Co.'s No. 2 Moss ..... Standing 5,055 ft.
Union Sulphur Co.'s No. 1 Martha Moss ..... Drlg. lime rock 6,601 ft.
Vacuum Oil Co. and Gulf Ref. Co.'s No. 28 Miller ..... Pulling screen 5,060 ft.
Vacuum Oil Co. and Gulf Ref. Co.'s No. 29 Miller ..... Set screen 3,874 ft.
Vacuum Oil Co.'s No. 30 Miller ..... Derrick.
Vacuum Oil Co.'s No. 31 Miller ..... Location.
Vacuum Oil Co.'s No. 6 Bayou State ..... Total depth 3,777 ft.; sidetracking at 3,393 ft.
Yount Lee Oil Co.'s No. 1 Miller ..... Drlg. water sand 7,415 ft.

HACKBERRY—CAMERON PARISH

Cacasieu Oil Co.'s No. 6 Caldwell ..... Abandoned 4,724 ft.
The Texas Company's No. 7 State ..... Drlg. heaving shale 4,878 ft.
Yount Lee Oil Co.'s No. 32 State Land ..... Drlg. shale and lime 2,527 ft.
Yount Lee Oil Co.'s No. 2 Portia ..... Abandoned 5,206 ft.

JENNINGS—ACADIA PARISH

Yount Lee Oil Co.'s No. 9 Housierre Latrielle ..... Drlg. shale 7,600 ft.
Yount Lee Oil Co.'s No. 7 Crowley ..... Drlg. hard sand 5,010 ft.

VINTON—CALCASIEU PARISH

Emerson-Moore's No. 1 Gray (workover) ..... Drlg. sand and lime 3,326 ft.
Edgerly Pet. Co.'s No. 2 McLean ..... Drlg. sandy shale 3,405 ft.
Gulf Ref. Co.'s No. 2 Gardner (workover) ..... Total depth 3,411 ft.; pulling screen to deepen.
Gulf Refining Co.'s No. 69 G.&N.G. (workover) ..... Rigging up to deepen.
Gorbat Oil Co.'s No. 1 Clement Lyons ..... Rig.
Lucky Ten Oil Co.'s No. 1 Lizzo ..... Shut down 3,236 ft.
Vinton Pet. Co.'s No. 2 Gray (workover) ..... Total depth 3,132 ft.; rig up to deepen.
Wilson-Broach's No. 3 Wilson (workover) ..... Drlg. 3,539 ft.

BAYOU BOUILLON—ST. MARTIN PARISH

Rycade Oil Corp.'s No. 1 Woodyard Lake ..... Coring shale and streaks of sand 6,084 ft.
Rycade Oil Corp.'s No. 4 State ..... Drlg. sandy shale 2,869 ft.

STARKS—CALCASIEU PARISH

Adams Oil Co.'s No. 1 Roderick ..... No report.
I. O. Davis' No. 1 Industrial ..... No report.
I. G. Sutton et al's No. 2 Industrial ..... Rig.
Gulf Ref. Co.'s No. 25 Lutcher-Moore ..... Comp. flowing 27 bbls. 1,230 ft.

SWEET LAKE—CAMERON PARISH

Magnolia Pet. Co.'s No. 1 Sweet Lake ..... Abandoned 7,510 ft.

MISCELLANEOUS WILDCATS
TEXAS
AUSTIN COUNTY

Empire Gas & Fuel Co.'s No. 1 Kuntze, San Felipe ..... Shale 1,430 ft.; cemented 12½-in. casing 1,220 ft.
O'Hara et al's No. 1 Schrader ..... Shut down for fuel 1,794 ft.

BRAZORIA COUNTY

The Texas Company's No. 1 Ewin, Harvey Little Sur. .... Standing 7,140 ft.
The Texas Company's No. 1 J. H. Murdock, Fresno ..... Drlg. shale 3,495 ft.
Mills Bennett Prod. Co.'s No. 1 Random, Allen ..... Total depth 5,363 ft.; fishing whipstock 4,643 ft.
Mills Bennett Prod. Co.'s No. 2 Allen ..... Drlg. sand and lime 4,381 ft.
Faust et al's No. 5 Faust ..... Drlg. rock 5,321 ft.
Freeport Sulphur Co.'s No. 2,001 fee, Bryan Heights ..... Drlg. sandy shale 4,273 ft.
Freeport Sulphur Co.'s No. 1 Salburn ..... Anhydrite 1,675 ft.
Freeport Sulphur Co.'s No. 1 Stratton ..... Drlg. gumbo 1,097 ft.
Layne et al's No. 7-A Wisdom, Damon Mound ..... Drlg. 100 ft.
Rycade Oil Corp.'s No. 2 Seaburn, Stratton Ridge ..... Drlg. hard sand and boulders 1,263 ft.
Steel & Strickland's No. 1 Lockbridge ..... Spudded and shut down.
United Oil Syndicate's No. 1 Moores, Francis Moore Sur... Shut down 1,462 ft.

CALHOUN COUNTY

The Texas Company's No. 1 Thomas, J. P. Tilley Sur. .... Drlg. hard sand 5,577 ft.

CHAMBERS COUNTY

Chicago Oil Corp.'s No. 1 Lawrence ..... Total depth 3,948 ft.; cmtd. csg.
Shell Pet. Corp.'s No. 2 Herff, Moss Bluff ..... Drlg. sandy shale 3,439 ft.
Pure Oil Co.'s No. 1 J. H. K. Ranch, Oyster Bayou ..... Sandy shale and lime 6,320 ft.; abandoned.

GRIMES COUNTY

Deering et al's No. 1 Munker, Darius Gregg Sur. ..... Drlg. shale 2,529 ft.
Deering & Noble's No. 1 Templeton, 6 miles south of Navasota ..... Shut down for fuel 3,263 ft.

HARDIN COUNTY

D. O. Speight's No. 1 fee, near Batson ..... Shut down 2,857 ft.

HARRIS COUNTY

Baldwin and associates' No. 1 Kitzman, Cypress ..... Shut down 4,247 ft.
Gulf States Oil Co.'s No. 1 Angsperger ..... No report.
Humble Oil & Ref. Co.'s No. 8 Warren, Hockley ..... Total depth 4,708 ft.; reaming 4,651 ft.
Lone Star Oil Co.'s No. 1 McDade, N. Brady Sur. ..... Drlg. sand and lime 1,804 ft.
W. C. Turnbow et al's No. 1 Miller, Arthur McCormick Sur. ..... Rig.

JACKSON COUNTY

Jackson County Oil Syndicate's No. 8 Drushell, Edna .... Gas sand 3,866-70 ft.; cmtd. 6⅝-in. csg. 3,864 ft.
Jackson County Oil Syndicate's No. 2 Lee ..... Drlg. sandy lime 3,794 ft.
Warner-Quinlan's No. 1 Hungerford, Henry Smith Sur... Location.

JEFFERSON COUNTY

Deep Test Oil Co.'s No. 1 McFaddin, Chaisson Sur. ..... No report.
The Texas Company's No. 4 Pipkin, Big Hill ..... Drlg. sand and shale 1,864 ft.

LIBERTY COUNTY

Gulf Prod. Co.'s No. 2 McFaddin, Moss Bluff ..... Oil sand 5,751-57 ft.; cmtd. 6⅝-in. csg.
Hamm et al's No. 1 Harvard, Davis Hill ..... Location.
Humble Oil & Ref. Co.'s No. 1 Breeding, Moss Bluff .. Drlg. shale 3,996 ft.
Humble Oil & Ref. Co.'s No. 1 Orlando Hylton, Moss Bluff ..... Drlg. shale 5,585 ft.
Humble Oil & Ref. Co.'s No. 1 Sergent, Moss Bluff ..... Drlg. shale 3,893 ft.
Rycade Oil Corp.'s No. 1 Heiskell ..... Drlg. shale 4,336 ft.
Tucker et al's No. 1 Bell, Devers ..... Derrick.

MATAGORDA COUNTY

H. C. Cockburn's No. 2 Hawkins, Shepherds Mott ..... Drlg. gumbo 1,861 ft.
Empire Gas & Fuel Co.'s No. 1 Baker, Citrus Grove ..... Drlg. sandy lime 5,394 ft.

MONTGOMERY COUNTY

Lake Creek Oil Co.'s No. 1 Hunt, south of Conroe ..... Drlg. 900 ft.
Price & Whitehead's No. 2 Guerges ..... Shut down 2,956 ft.

NACOGDOCHES COUNTY

E. L. Burke et al's No. 1 Latimer, Jose De Los Santos Sur. ..... No report.

REFUGIO COUNTY

Blanco Oil Co.'s No. 1 Dorman ..... Shut down 3,120 ft.

SAN JACINTO COUNTY

E. P. Edwards et al's No. 1 Bennett, northwest of Cold Springs ..... Rig.

VICTORIA COUNTY

Houston Oil Co.'s No. 1 McFaddin, C. O. Edwards Sur. .. Coring sand 3,799 ft.; drill stem test 3,768-79 ft. showed salt water.
The Texas Company's No. 1 McFaddin, H. Bonny Sur. ... Drlg. hard sand 5,252 ft.; to make drill stem test.
Lion Oil & Ref. Co.'s No. 2 McFaddin, M. Traviers Sur. .. Drlg. hard sand 6,047 ft.
Newton et al's No. 1 West ..... Shut down 1,550 ft.

WHARTON COUNTY

H. H. Given's No. 1 Hudgins, near Hungerford ..... Shut down 414 ft.

SOUTH LOUISIANA
CALCASIEU PARISH

Cranford Doyle's No. 1 Johnson, Sec. 23-9s-13w..... Standing with surface csg. cmtd.
Dr. Thomas et al's No. 1 John Hewitt ..... Location.

CAMERON PARISH

Shell Pet. Corp.'s No. 15 Watkins, Black Bayou ..... Sandy shale 4,402 ft.; cmtd. 9⅝-in csg. 4,382 ft.
Shell Pet. Corp.'s No. 1 State, Black Bayou ..... Coring sandy shale 5,161 ft.
Vacuum Oil Co.'s No. 1 Cameron Meadows, Sec. 21-14s-13w ..... Oil sand 5,240 ft.; csg. parted; sidetracking 3,871 ft.
The Texas Company's No. 6 State, Calcasieu Lake ..... Drlg. cap rock 1,920 ft.

IBERIA PARISH

Jefferson Oil Co.'s No. 9 Lake Peigneur, Jefferson Island.. Abandoned in cap rock 824 ft.
The Texas Company's No. 6 Vermilion Bay ..... Location.

IBERVILLE PARISH

Shell Pet. Corp.'s No. 5 Wilbert, White Castle ..... Total depth 5,004 ft.; trying to sidetrack.
Standard Oil Co.'s No. 7 Wilbert ..... Derrick.
Standard Oil Co.'s No. 8 Wilbert ..... Drlg. lime 3,630 ft.
Standard Oil Co.'s No. 1 E. B. and S. P. Schwing, Bayou Blue ..... Drlg. gumbo 2,910 ft.
Standard Oil Co.'s No. 1 Baist Cooperage, Bayou Blue ... Bldg. derrick.

JEFFERSON PARISH

Humble Oil & Ref. Co.'s No. 1 Delaware Sec. 2-15s-23e ... Drlg. sticky shale 5,103 ft.

JEFFERSON DAVIS PARISH

Shell Pet. Corp.'s No. 1 Heyd, Iowa ..... Location.
Vacuum Oil Co.'s No. 1-A DeVilbiss, Roanoke ..... Abandoned 5,126 ft.

LA FOURCHE PARISH

The Texas Company's No. 1 L.L.&E. Lacoville ..... No report.

PLAQUEMINE PARISH

Gulf Ref. Co.'s No. 1 Buras Levee Board ..... Spudded.
Humble Oil & Ref. Co.'s No. 2 Cockrell-Moran, Lake Grand Fcaille ..... Rigged up.
The Texas Company's No. 4 State, Garden Island ..... No report.
The Texas Company's No. 5 State, Garden Island ..... Location.

ST. MARTIN PARISH

The Texas Company's No. 2 Iberville Land ..... Drlg. shale 4,205 ft.
The Texas Company's No. 3 Iberville Land ..... Location.
The Texas Company's No. 4 St. Martin, Hager ..... Derrick.
The Texas Company's No. 5 St. Martin, Hager ..... Location.

ST. MARY PARISH

The Texas Company's No. 1 South Coast, Sec. 41-14s-10e.. Drlg. shale 7,756 ft.

TERREBONNE PARISH

Louisiana Gas & Fuel Co.'s No. 9 Minor, Houma ..... Cmtd. 15¼-in. csg. 198 ft.
The Texas Company's No. 1 L.L.&E., Bay St. Elaine ..... Location.
The Texas Company's No. 5 State, Bay St. Elaine ..... Derrick.
The Texas Company's No. 4 State, Caillou Island ..... Location.
The Texas Company's No. 5 State, Caillou Island ..... Drlg. gumbo 2,980 ft.
The Texas Company's No. 3 State, Dog Lake ..... Drlg. sand 4,256 ft.
The Texas Company's No. 4 La. L. & E., Four Isle ..... Drlg. sandy lime 4,776 ft.
The Texas Company's No. 2 La. L. & E., Bay Junop ..... Drlg. sandy shale 5,060 ft.
The Texas Company's No. 6 State, Lake Pelto ..... Derrick.
The Texas Company's No. 5 State, Lake Barre ..... Drlg. gumbo 367 ft.
The Texas Company's No. 6 State, Lake Barre ..... Driving piling.
The Texas Company's No. 7 State, Lake Barre ..... Driving piling.

SOUTHWEST TEXAS PROVEN AREAS

(Continued from Page 46)

Gulf Production Co.'s No. 8 Posey-Baker ..... T. D. 2,560 ft.; completed for 1,000 bbls.
Gulf Production Co.'s No. 9 W. R. Posey ..... Derrick.
Gulf Production Co.'s No. 3 Tadlock, 750 ft. from N line, 150 ft. from W line of lease, J. C. Darst Sur. ..... T. D. 2,629 ft.; completed for 489 bbls.
Gulf Production Co.'s No. 4 Tadlock, 150 ft. from N line, 450 ft. from W line of lease, J. C. Darst Sur. ..... T. D. 2,624 ft.; completed for 920 bbls.
Humble Oil & Refining Co.'s No. 2-A Dowdy, NE cor. of "A" lease ..... Location.
Humble Oil & Refining Co.'s No. 15-A Denman, 150 ft. N and 200 ft. E of NW cor. of The Texas Company's Willie lease ..... T. D. 2,558 ft.; completed for 1,000 bbls.
Humble Oil & Refining Co.'s No. 17-A L. G. Denman .... Spudded.
Humble Oil & Refining Co.'s No. 18-A L. G. Denman .... Spudded.
Louisiana Oil Refining Co.'s No. 7 Thomas Dix, 300 ft. NW of No. 6, J. W. Robinson Sur. ..... T. D. 2,561 ft.; completed for 520 bbls.
Magnolia Petroleum Co.'s No. 3 Annie Knodel, 150 ft. from NW line, 600 ft. from SW line, J. W. Robinson Sur. ..... T. D. 2,590 ft.; completed for 400 bbls.
Magnolia Petroleum Co.'s No. 9 Thomas Dix, east offset to No. 8 Thomas Dix, J. W. Robinson Sur. ..... T. D. 2,570 ft.; completed for 500 bbls.
Magnolia Petroleum Co.'s No. 10 Thomas Dix, east offset to No. 3 Thomas Dix, J. W. Robinson Sur. ..... T. D. 2,564 ft.; set csg.
Magnolia Petroleum Co.'s No. 11 Thomas Dix, east offset to No. 3 Dix, 300 ft. NE of No. 10, J. W. Robinson Sur. ..... T. D. 2,602 ft.; completed for 500 bbls.
Magnolia Petroleum Co.'s No. 12 Thomas Dix, 450 ft. from NE and NW lines of tract, J. W. Robinson Sur. ..... T. D. 2,564 ft.; waiting on cement.
Magnolia Petroleum Co.'s No. 1 Nora Huff, east offset to company's No. 4 L. V. Echols, James Hodges Sur. ..... T. D. 2,290 ft.; completed for 375 bbls.
Magnolia Petroleum Co.'s No. 4 Rand Miller, 150 ft. from NW line, 1,350 ft. from NE line of lease, J. B. Alexander Sur. ..... T. D. 2,654 ft.; preparing to complete.
The Texas Company's No. 9 Dallas-Wilson, 150 ft. from E line of company's Wilson lease, Robinson Sur. ..... T. D. 2,628 ft.; completed for 600 bbls.
The Texas Company's No. 5-A Knoblock 111 ..... T. D. 2,490 ft.; 408 bbls. per hour, complete.
The Texas Company's No. 8-B C. Knoblock, 1,080 ft. from NE line, 150 ft. from SE line of 75-ac. tract, J. R. Robinson Sur. ..... Location.
The Texas Company's No. 2 Parrish, 150 ft. from S line, 450 ft. from W line of lease ..... T. D. 2,624 ft.; completed for 840 bbls.
The Texas Company's No. 10-B Knoblock, 150 ft. each way out of the NW cor. of "B" lease, J. Robinson Sur. ..... T. D. 2,493 ft.; completed for 1,350 bbls.
The Texas Company's No. 11-B Knoblock, 450 ft. NW and 150 ft. SW from NE cor. of the company's "B" lease ..... T. D. 2,583 ft.; completed for 480 bbls.
The Sun Oil Co.'s No. 12 Knoblock, 150 ft. NE and SE of farm lines ..... T. D. 2,496 ft.; completed for 4,800 bbls.

CHAPMAN POOL—WILLIAMSON COUNTY

W. D. Anderson's No. 6-A T. P. Simmons ..... Rigging up.
W. D. Anderson's No. 7 M. V. Lawrence ..... T. D. 2,242 ft.; shut down.
W. D. Anderson's No. 8 M. V. Lawrence ..... Location.
Bartlett & Wilson's No. 1 R. E. Stewart ..... Drlg.
Bartlett & Wilson's No. 2 R. E. Stewart ..... T. D. 790 ft.; drlg.
E. L. Chapman's No. 6-B J. C. Abbott ..... T. D. 2,200 ft.; abandoned dry.
E. L. Chapman et al's No. 3-D Abbott ..... T. D. 1,690 ft.; completed for 250 bbls.
E. L. Chapman et al's No. 3 F. Fuchs ..... T. D. 1,887 ft.; completed for 60 bbls.
E. L. Chapman et al's No. 2 J. Sides ..... T. D. 2,221 ft.; abandoned dry.
E. L. Chapman et al's No. 2-A Sides ..... Rigging up.
J. L. Collins & Co.'s No. 5 M. V. Lawrence, 150 ft. from W line, 515 ft. from S line of 27-ac. tract, S. Miller Sur. ..... T. D. 1,462 ft.; drlg.
J. L. Collins & Co.'s No. 7 M. V. Lawrence, 150 ft. from E line, 215 ft. from S line, 27-ac. tract, S. Miller Sur. ..... T. D. 100 ft.; temp. abandoned.
E. E. Ertel's No. 1 H. Swanson ..... T. D. 1,025 ft.; shut down.
Elliott and Moore's No. 1 A. J. Carlson ..... T. D. 40 ft.; shut down.
F. Fuchs' No. 1 C. D. Johnson ..... T. D. 1,280 ft.; drlg.
A. J. Luke's No. 1 A. Simmons, 500 ft. from N line, 450 ft. from W line, 25-ac. tract, H. Owne Sur. .... T. D. 2,210 ft.; dry and abandoned.
McNeal et al's No. 7 Kilgore ..... Location.
E. C. Mead's No. 1 Abbott, 100 ft. from N and W lines of 6-ac. tract, S. Miller Sur. ..... T. D. 1,940 ft.; completed for 100 bbls.
Marts et al's No. 1 Ollie Simmons ..... T. D. 1,792 ft.; set csg.
M. M. Rowan's No. 1 A. Jackson ..... T. D. 1,900 ft.; abandoned dry.
G. Stratton's No. 5 J. C. Abbott, 450 ft. from E line, 150 ft. from S line of 32-ac. tract, S. Miller Sur. .... Spudded.

PETTUS AREA—BEE COUNTY

Buchanan & Lefevre's No. 1, Block 20, Pettus Townsite, located center of the block, Kerr Sur. ..... T. D. 3,876 ft.; completed for 800 bbls.
Buchanan and Karone Oil Co.'s No. 1, Blk. 8, Pettus Townsite, center of the block ..... Moving in.
Batex Oil Co.'s No. 2 Burnett, 361 ft. from N line, 900 ft. from E line, John Pace Sur. ..... T. D. 3,934 ft.; plugging back.
Batex Petroleum Co.'s No. 3 Burnett, 360 ft. from N line, 600 ft. from E line of 320-ac. tract, Kerr Sur. ..... Location.
C. R. M. Drilling Co.'s No. 1, Blk. 9, Pettus Townsite, center of block ..... Derrick.
Hawn, Mauldin and Grayburg's No. 1 Copeland, 450 ft. from S line, 150 ft. from E line, 20-ac. tract, Hadley Sur. ..... T. D. 1,450 ft.; drlg.
Houston Oil Co.'s No. 3 Neumann, 600 ft. from S line, 300 ft. from W line, 197-ac. tract, Kerr Sur. ..... T. D. 3,714 ft.; set csg.
Houston Oil Co.'s No. 1, Block 21, Pettus Townsite, center of block ..... T. D. 450 ft.; set csg.
Houston Oil Co.'s No. 1 Mathews, center of Blk. 32, Pettus Townsite ..... T. D. 3,913 ft.; completed for 20,000,000 ft. gas.
Houston Oil Co.'s No. 1, Blk. 39, Pettus Townsite, center of block ..... T. D. 3,925 ft.; completed for 20,000,000 ft. gas.
Humble Oil & Refining Co.'s No. 7 McKinney, 600 ft. W of No. 6, south offset to Blk. 22, Pettus Townsite ..... T. D. 3,886 ft.; completed for 250 bbls.
J. L. Mauldin's No. 1 fee, 1,300 ft. N of S line, 150 ft. E of Medio Creek, Kerr Sur. ..... T. D. 2,425 ft.; drlg.
Moody-Seagraves Producing Co.'s No. 2 McKinney, 3,840 ft. from E line, 450 ft. from S line, McKinney tract, R. C. Ballard Sur. ..... Location.
The Texas Company's No. 2 J. R. Scott, 200 ft. from N line, 150 ft. from W line, J. M. Urango Sur. ..... T. D. 690 ft.; drlg.
The Texas Co.'s No. 3 J. R. Scott, 7,100 ft. from No. 1, SW ..... Location.
Union Producing Co.'s No. 23 Ray, east offset to Blk. 39 of Pettus Townsite ..... T. D. 414 ft.; drlg.
Union Producing Co.'s No. 25 Ray, 1,700 ft. from S line, 1,400 ft. from E line of P. Miller Sur. ..... Location.
Union Producing Co.'s No. 26 Ray, 2,500 ft. from S line, 2,000 ft. from E line, P. Miller Sur. ..... Location.
Union Producing Co.'s No. 30 Ray, 1,100 ft. from S line, 600 ft. from W line, W. J. Porter Sur. ..... T. D. 3,939 ft.; coring.
Wilson and Hill's No. 1, Blk. 14, Pettus Townsite, center of the block ..... Waiting on permit.
Wilson and Hill's No. 1, Blk. 16, Pettus Townsite, center of the block ..... Ready to spud.

LASSATER POOL—BROOKS COUNTY

Houston Oil Co.'s No. 2 Holbien-Wormser, 2,100 ft. from W line, 200 ft. from S line, Wormser 962-ac. tract, Maguellas grant ..... T. D. 4,168 ft.; drlg.

AGUA DULCE FIELD—NUECES COUNTY

South Texas Production Co.'s No. 2 Ollie Furl, 1,200 ft. NE of No. 1 ..... T. D. 1,986 ft.; setting csg.; gas sand.
South Texas Production Co.'s No. 3 Walter, 800 ft. from S line, 460 ft. from E line of Walters tract in Section 34 ..... T. D. 1,984 ft.; setting csg. to test.

SAXET FIELD—NUECES COUNTY

Saxet Oil & Gas Co.'s No. 2 Donnegan, 2,150 ft. due S of No. 1 Donnegan ..... T. D. 4,093 ft.; cored water sand.
Saxet Oil & Gas Co.'s No. 7 Dunn, 2,400 ft. NW and 200 ft. NE of S cor. of Dunn farm ..... Derrick.

WHITE POINT FIELD—SAN PATRICIO COUNTY

Saxet Oil & Gas Co.'s No. 17 Rachel, 150 ft. from N line, 1,000 ft. from E line of 200-ac. tract ..... T. D. 1,905 ft.; coring.

LION McFADDEN POOL—VICTORIA COUNTY

Houston Oil Co.'s No. 1 McFadden, 330 ft. S and 900 ft. E of SE cor. of survey, L. Mann Sur. ..... T. D. 3,800 ft.; coring shale.
Lion Oil Refining Co.'s No. 2 McFadden, 1,917 ft. W of NE cor. and 512 ft. at right angles from N line of Edwards Sur., 660 ft. E of No. 1 in the M. J. Travesia Sur. ..... T. D. 6,070 ft.; drlg.

LAREDO DISTRICT

SCHOOLFIELD-O'BYRNE POOL—DUVAL COUNTY

Magnolia Petroleum Co.'s No. 1 Edge-Hahl, 150 ft. from N line, 150 ft. from W line, Sur. 63 ..... T. D. 2,860 ft.; drlg.
F. M. Frasher and R. F. Schoolfield's No. 1 Duval Land Co., 990 ft. from N line, 1,320 ft. from W line, Sur. 123 ..... Location.

RANDADO POOL—JIM HOGG COUNTY

J. W. Pippin's No. 1 N. Hinnant, 150 ft. each way from SW cor., Blk. 11, Sur. 147 ..... Derrick.

S. R. C. POOL—DUVAL COUNTY

S. R. C. Oil Co.-Vacuum Oil Co.'s No. 2 Duval County Ranch Co., 1,050 ft. from E line, 2,050 ft. from N line, Sur. 293 ..... Rigging up.

COLE POOL—DUVAL COUNTY

Magnolia Petroleum Co.'s (O'Hern & Seacord) No. 3-A Benavides, 330 ft. from SW line, 330 ft. from SE line, Blk. 12, Sur. 174 ..... T. D. 1,838 ft.; rigging up to deepen.

ROMA POOL—STARR COUNTY

The Texas Company's No. 5-A V. C. de Guerra, 675 ft. from N line, 675 ft. from E line, Share 305, Por. 67, Jurisdiction of Mier ..... T. D. 2,800 ft.; drlg.

REISER POOL—WEBB COUNTY

O. W. Killam's No. 1 Killam (Villegas) on Blk. 4, Sur. 1,879 ..... T. D. 2,050 ft.; drlg.

AVIATOR POOL—WEBB COUNTY

O. W. Killam's No. 3 Bruni, 1,050 ft. from E line, 150 ft. from N line, of the N one-half of Sur. 835 .... T. D. 1,872 ft.; drlg.

CAROLINA-TEXAS POOL—WEBB COUNTY

Magnolia Petroleum Co.'s No. 1 Jones-Wright, 330 ft. from S line, 330 ft. from W line, Sur. 674 ..... T. D. 4,775 ft.; drlg.
George S. Marshall's No. 1 C. W. Webster, 810 ft. from S line, 150 ft. from W line, Sur. 684 ..... Derrick.

COLE FIELD—WEBB COUNTY

Magnolia Petroleum Co.'s No. 1 Benavides, 150 ft. from SW line, 150 ft. from SE line, Blk. 389, Hale Subd., Arispe grant ..... T. D. 1,751 ft.; completed for 12,000,000 ft. gas.

CHARCO REDONDO POOL—ZAPATA COUNTY

C. R. Moore and J. W. Moore's No. 1 Adela G. de Flores, 330 ft. from NW line, 330 ft. from NE line, Doty Subd. ..... T. D. 1,140 ft.; testing.
C. R. Moore and J. W. Moore's No. 2 Adela G. de Flores, 150 ft. from NE line, 150 ft. from SE line, Doty Subd. ..... T. D. 50 ft.; standing.

JENNINGS-MUCKLEROY POOL—ZAPATA COUNTY

Alamo Drilling & Leasing Co.'s (Claggett) No. 6 Trevino, 450 ft. from S line, 150 ft. from E line, Blk. 1, Sur. 66 ..... Location.
Allied Gas Co. and Allen and Morris' No. 9 Gutierrez, 3,663 ft. from SE line, 150 ft. from NE line, Share 4, Fansler Partition, Comitas grant ..... T. D. 1,288 ft.; completed for 60 bbls.
Allied Oil & Gas Co.-Allen and Morris' No. 10 Gutierrez, 3,960 ft. from SE line, 150 ft. from NE line, Share 4, Fansler Partition, Comitas grant ..... T. D. 1,288 ft.; waiting on cement.
H. H. Coffield's No. 1 S. Benavides, 150 ft. from NW line, 150 ft. from SW line, Share 34, Fansler Partition ..... T. D. 1,390 ft.; completed for 15,000,000 ft. gas.
Edgington & Niles' (Gatlen & Matthews) No. 1 Garza, 150 ft. from S line, 150 ft. from W line, Blk. 18, Sur. 413 ..... T. D. 1,950 ft.; testing.
Keen and Jackson's No. 1 M. Garza, 150 ft. from NW line, 150 ft. from SW line, Blk. 59, Zorro ranch, Comitas grant ..... T. D. 387 ft.; resumed drlg.
K. D. Harrison's No. 1 Pedro de los Santos, 150 ft. from SE line, 150 ft. from NE line of Fansler 52-ac. tract, Share 6, Comitas grant ..... T. D. 1,982 ft.; tested salt water.
Nordan and Morris and Grimm and Yakey's No. 1 S. Bustamente, 990 ft. from NE line, 150 ft. from NW line, Share 34, Fansler Partition, Comitas grant ..... Derrick.

W. R. Shankle's No. 6 Gutierrez, 1,800 ft. from NE line, 2,989 ft. from NW line, Share 4, Fansler Partition, Comitas grant ..... Derrick.
W. R. Shankle's No. 10 Trevino, 661 ft. from NW line, 150 ft. from SW line, Block 15, Sur. 65 ..... T. D. 1,260 ft.; completed for 120 bbls.
W. R. Shankle's No. 11 Trevino, 961 ft. from NW line, 150 ft. from SW line, Blk. 15, Sur. 65 ..... T. D. 1,280 ft.; testing.
S. R. C. Oil Co.'s No. 5-B Cuellar, 450 ft. from NW line, 150 ft. from SW line, Blk. 10, Sur. 65 ..... T. D. 1,234 ft.; testing.
S. R. C. Oil Co.'s No. 9-A Cuellar, 450 ft. from NW line, 150 ft. from NE line, Blk. 1, Sur. 65 ..... T. D. 1,029 ft.; waiting on cement.
S. R. C. Oil Co.'s No. 10-A Cuellar, 150 ft. from NW line, 150 ft. from SW line, Blk. 10, Sur. 65 ..... Spudded.
S. R. C. Oil Co.'s No. 1-C Trevino, 150 ft. from NW line, 1,230 ft. from SW cor. of Blk. 14, Cerrito Blanco grant ..... T. D. 1,150 ft.; drlg.
S. R. C. Oil Co.'s No. 3-C (12-B) Trevino ..... Location.
S. R. C. Oil Co.'s No. 14-B Cuellar, 750 ft. from W line, 150 ft. from S line, Block 13, Sur. 65 ..... T. D. 3,300 ft.; testing.
Whicker, Arnold & Ahler's No. 3 Garza, 150 ft. from SW line, 450 ft. from SE line, Blk. 1, Zorro Ranch Subd., Comitas grant ..... Rigging up.

JENNINGS-CUELLAR POOL—ZAPATA COUNTY

O. W. Killam's No. 26-A Cuellar, 1,696 ft. from NE line, 4,637 ft. from NW line, Cerrito Blanco grant ... T. D. 1,553 ft.; drlg.
O. W. Killam's No. 27 Cuellar, 560 ft. from NW line, 1,750 ft. from NE line, Cerrito Blanco grant ..... T. D. 105 ft.; drlg.
O. W. Killam's No. 30-B Cuellar, 2,200 ft. from S line, 1,250 ft. from SW line, Sur. No. 277 ..... T. D. 850 ft.; drlg.
O. W. Killam's No. 1 R. Lopez, 600 ft. from E line, 475 ft. from S line, Blk. 6, Sur. 71 ..... T. D. 2,295 ft.; drlg.
O. W. Killam's No. 1 Slator, Blk. 1, Slator Pasture, Borrego grant ..... Spudded.

WILDCAT OPERATIONS IN SOUTHWEST TEXAS

(Continued from Page 46)

Southern Crude Oil Purchasing Co.'s No. 1 Holbien-Wormser, 990 ft. from E line, 1,000 ft. from S line of Blk. 39, E. P. de Maguellas Sur. ..... T. D. 3,816 ft.; drlg.

BEE COUNTY

William F. Morgan and Independent Oil & Gas Co.'s No. 1 Quincy, C Blk. 9 of 11,000-ac. Quincy Subd. of Bee County ..... T. D. 4,971 ft.; drlg.

O'Neal & Catlett's No. 1 Pat Pugh ..... Location.
Hurlbut et al's No. 1 Mrs. D. Chestnut ..... T. D. 1,380 ft.; shut down.
Walter Rawlins' No. 1 P. L. Campbell, C B.&B. Sur. .... Digging water well.
E. S. Price's No. 3 Weiss, 900 ft. due NE of No. 1 Weiss .. Location.
E. S. Price's No. 2 Weiss, 900 ft. due SW of No. 1 Weiss, B.&B. Sur. ..... T. D. 2,558 ft.; shut down.
Cosden Oil Co.'s No. 1 Stoltzfus, 2,310 ft. S and E lines of Sec. 14, Ragley Subd. of C. Miller ranch, Uranga Sur. ..... T. D. 4,015 ft.; drlg.
Humble and Hurlbut et al's No. 1 J. C. Wood, 150 ft. from NW line, 1,144 ft. from SW line of P. T. Irrigation Co. ..... T. D. 5,077 ft.; standing.
The Texas Company's No. 1 McCampbell, 150 ft. from N and E lines of 161-ac. tract, R. Pena Sur. ..... Location.
Edwin Jones' No. 3 Rapp, Tuletta Townsite, 630 ft. N line, 508 ft. E line of lease ..... T. D. 2,964 ft.; drlg.
Rowan and Hope's No. 1 Goree, 600 ft. S, 360 ft. W, Lot 4, T. B. Barton Sur. ..... Rigging up.

BEXAR COUNTY

Moore-Jauer's No. 1 Holly R. Ellison ..... T. D. 2,170 ft.; abandoned.
K. M. S. Pet. Co.'s No. 1 E. Salicky, 132 ft. from E line, 10 ft. S line of tract, Blk. 15, Mission Gardens ..... Location.
J. M. Russell's No. 1 F. L. Price, 1,590 ft. to N line, 660 ft. W line of tract in Angel Navarro Sur. ..... T. D. 206 ft.; standing.
J. M. Russell's No. 1 A. O. Miles, 1,600 ft. N line, 600 ft. W line 450-ac. tract, Angel Navarro Sur., 10 miles S from San Antonio ..... T. D. 483 ft.; drlg. shale.
Henry Yelvington et al's No. 1 Beck, 365 ft. from W line, 310 ft. from S line 100-ac. tract, SW cor. of P. W. Hays Sur., 7 miles E from San Antonio ..... T. D. 1,470 ft.; shut down.
Snyder, Reeves et al's No. 2 Glasscock, 12 miles NE of San Antonio ..... T. D. 200 ft.; drlg.
August Magel's No. 1 Alvin Beck, 520 ft. from W line, 1,300 ft. from S line of Sur. No. 36 ..... Location.
Penn Oil Co.'s No. 1 Cooksey, 1,150 ft. to E line, 150 ft. to N line of survey, J. Riall Sur. ..... T. D. 1,460 ft.; drlg. plugs.
Weibacher et al's No. 1 Ernst, 6,400 ft. S line, 900 ft. W line of J. Christopher Sur. ..... T. D. 450 ft.; shut down for repairs.
J. E. Weatherall and Ben C. Hilman's No. 1 Talley ..... Location.
Russell and Moore's No. 2 Mills, 20 ft. S of No. 1, Angel Navarro Sur. ..... T. D. 735 ft.; drlg.
Bowman and Waldrop's No. 1 Ridder, 1,000 ft. from S and W lines of 688-ac. tract, J. M. Sur. ..... T. D. 1,020 ft.; testing.

CALDWELL COUNTY

W. E. Allaun's No. 1 Cosey, SW cor. of tract ..... Location.
W. E. Allaun's No. 2 McKean, 300 ft. W of No. 1 ..... Location.
Batts et al's No. 1 E. P. Roebuck, 1,150 ft. from SE line, 2,400 ft. from NE lines of farm, A. Swift Sur. ..... T. D. 2,160 ft.; showing of oil.
Gulf Prod. Co.'s (Hertz & Thomas) No. 1 Kelley, 1,961 ft. from NE line, 150 ft. from NW line of Kelley tract, J. A. Neil Sur. ..... T. D. 2,488 ft.; drlg.
Cargill et al's No. 1 Thomas, 1,505 ft. from E line, 150 ft. from NE cor. of A. W. Jordan tract, J. Roberts Sur. ..... Derrick.
Anderson et al's No. 1 S. J. Barber, 300 ft. from SW line, 1,650 ft. from SE line, 392-ac. tract, Squire Damon Sur. ..... T. D. 1,905 ft.; oil showing; setting csg.
Blount and Mills' No. 1 McMahon, 275 ft. from SW line, 75 ft. from SE line of 50-ac. tract, J. Pinchback Sur. ..... Rigging up.

CALHOUN COUNTY

The Texas Company's No. 1 Thomas in the J. D. Tilly Sur. ..... T. D. 5,448 ft.; drlg.

COLORADO COUNTY

Lewis Slagel Drilling Co.'s No. 1 Henderson, 990 ft. from W line, 2,310 ft. from S line, Sec. 1, Blk. 57, T.&P. Sur. ..... Location.

COMAL COUNTY

Caldwell & Lanier's No. 1 T. J. Byler, 175 varas from W line, 370 varas from N line of 320-ac. tract in the H.E.&W.T. No. 5,894 Sur. ..... T. D. 450 ft.; setting csg.
New Braunfels Oil & Gas Co.'s No. 1 Adolph Seidemann, 269 ft. to NE line, 470 ft. to NW line of farm in the A. M. Esneuricals 11-League Sur., 1 mile SE from New Braunfels ..... T. D. 1,570 ft.; standing.

DEWITT COUNTY

Penn Oil Co.'s No. 1 Junker, center N half 201-ac. tract, Pettus Sur. ..... Spudded.
H. T. Roe's No. 1 Leinhardt ..... T. D. 2,170 ft.; shut down.
A. H. Gibson et al's No. 1 Von Roeder, 750 ft. N line, 200 ft. E line of farm, W. G. Hill League ..... T. D. 1,480 ft.; reinstated; preparing to deepen.

DUVAL COUNTY

Sal Oil & Gas Co.'s (Southern Oil Co.) No. 2 Welder-Wood, 1,980 ft. E line, 2,490 ft. N line, Sur. 215 ..... T. D. 2,500 ft.; temp. abandoned.
Sloan et al's No. 1 Luby, SW cor. of Sur. 593 ..... Location.
S. R. C. Oil Co.'s No. 2 Duval County Land Co., Sur. 280 ..... Spudded; water well.

EDWARDS COUNTY

Phillips Pet. Corp.'s No. 2 A. G. Holman, 320 ft. from N and E lines of SE of tract, C.C.S.D.&N.G.R.G. Sur. No. 25 ..... T. D. 5,810 ft.; drlg. lime.
James Dalgish's No. 2 Peterson, 850 ft. N line, 1,100 ft. W line of Sec. 82, Blk. E in the H.E.&W.T. Sur. .. Location.
James Dalgish-Morrow's No. 1 Peterson, NW cor. Sec. 82, Blk. E, H.E.&W.T.R.R., NE cor. of county in the H.E.&W.T.R.R. Sur. ..... T. D. 4,150 ft.; drlg.

FRIO COUNTY

A. H. Wray's No. 1 Burns estate, 700 ft. N, 330 ft. E of C Sec. 123, Antone Hupzor ..... T. D. 2,368 ft.; W.O.C.

GOLIAD COUNTY

Union Prod. Co.'s No. 12 George Ray, 2,350 ft. SW of NE line, 330 ft. NW of SE line, George A. Ray 400 ac. in the Wm. Southerland Sur. ..... T. D. 5,134 ft.; drlg.
A. G. Riemenschneider's No. 1 A. T. Fromme, 275 ft. from N line, 912 ft. W line of 300-ac. tract, P. Dexeter Sur. ..... T. D. 2,257 ft.; shut down.
Gibson Oil Co.'s No. 1 Cyrus Parks, 3,000 ft. S and 2,500 ft. E of NW cor. of Parks ranch, Ferguson Sur. ..... T. D. 2,900 ft.; drlg.
T. B. Slick's No. 1 Poetler, 1,500 ft. from SW line, 900 ft. from SE line of 591-ac. tract, Obid Marshall Sur. ..... Location.

GONZALES COUNTY

Mardon Oil Co.'s No. 1 Borrer, 150 ft. N and W in the James Stewart Sur., 5 miles NW from Waelder .... T. D. 1,850 ft.; shut down.
Mardon Oil Co.'s No. 1 Robinson ..... T. D. 3,284 ft.; waiting for orders.
United North & South Dev. Co.'s No. 2 Preston, 1,050 ft. NE, 450 ft. NW of upper S or SW cor. of Oethkin one-third league, 900 ft. SE of Preston No. 1 ... Location.
A. J. Keiffer et al's No. 1 B. B. Dix, 550 ft. W of E line, 2,775 ft. N of S line (Guadalupe River) in the Ira Nash Sur., 4 miles SE from Darst Creek ..... T. D. 2,816 ft.; coring.
Andibus & Cummings' No. 1 R. D. & J. C. Miller, 523 ft. from S line, 1,000 ft. from E line, Ann Williams Sur. ..... T. D. 1,870 ft.; drlg.

GUADALUPE COUNTY

Guy Lewis' No. 1 Arno Link, 1,500 ft. NE line, 1,155 ft. SE line, Carvajal Sur. ..... T. D. 2,530 ft.; shut down for repairs.
J. S. Suttle's No. 2 A. Baenzinger, 40 ft. E line, 150 ft. S line of tract in the A. O. Mansola Sur., 5½ miles S from Seguin ..... T. D. 1,947 ft.; drlg. Del Rio.
Grayburg Oil Co.'s No. 2 Wells, 5,730 ft. E line, 2,490 ft. S line of NE cor. of Wells tract in the James D Baume Sur., 6 miles SW from Darst Creek ..... T. D. 3,958 ft.; abandoned dry.
Brown Hinds et al's No. 1 George Altzger, 1,300 ft. from SE line, 1,100 ft. from SW line of 120-ac. tract in A. Mansola Sur. ..... T. D. 1,975 ft.; shut down in Del Rio.
Ray Oil Co.'s No. 1 R. Feising, 300 ft. NW line, 450 ft. NE line 120-ac. tract in the M. Baker Sur. ..... T. D. 900 ft.; shut down.
Miller & Calhoun's No. 1 Lindenberger, 750 ft. from E line, 650 ft. from S line of 250-ac. tract ..... T. D. 1,278 ft.; coring.
Cranfill & Reynolds' No. 1 Meyer, 150 ft. S and E lines 100-ac. tract, J. Canter Sur. ..... T. D. 2,324 ft.; sulphur showing.
O. K. Emerson's No. 1 C. A. Phillips, center of 80-ac. tract, Velda Sur. ..... Moving in.
Jones and Erwin's No. 1 O. Forrester, 2,700 ft. from NE cor., 450 ft. from NW line, O Forrester tract, Pate Sur. ..... Location.
Trinity Drillers' No. 2 White, 1,205 ft. from NE line, 50 ft. from SE line, 166-ac. tract, Miller Sur. ..... Rigging up.
Jones and Erwin's No. 1 Hoese, 150 ft. each way out of NE cor. of 200-ac. tract, J. Leal Sur. ..... Spudded.
Adams and Lyles' No. 1 Seligman, 150 ft. from E line, 300 ft. from S line of 462-ac. tract, John King Sur. ..... Rigging up.

HAYS COUNTY

Hailey & Whittington's No. 1 Heidenrich, Hemphill Sur... T. D. 735 ft.; shut down.
San Marcos Oil & Gas Co.'s No. 1 A. H. Alford ..... T. D. 513 ft.; waiting on cement.

JACKSON COUNTY

The Texas Company's No. 1 Mitchell, 1,750 ft. E, 880 ft. N of SW cor. Ewing Sur. ..... T. D. 6,044 ft.; drlg. sand.
Warner-Quinlan's No. 1 Hungerford, 934 ft. from SE line, 934 ft. from SW line, 254-ac. tract, H. Smith Sur ..... Location.

JIM HOGG COUNTY

Cole Petroleum Co.'s No. 1 Allen, 150 ft. from W line, 336 ft. from N line, Blk. 7, Sur. No. 23 ..... Rigging up.
Wm. H. Barnhart's No. 1 McCampbell, 450 ft. to W line, 150 ft. to N line, Lot 33, Barnhart Subd., Los Viboritas grant ..... T. D. 2,005 ft.; standing.
E. E. Watts' No. 1 Gomez, 4,200 ft. to N line, 1,400 ft. to E line of Sur. 125 ..... T. D. 1,103 ft.; heavy gas showing.
J. D. Pulliam's No. 1 Jones, 1,020 ft. W line, 1,020 ft. S line, Share 5-A, Hinojosa Sur. ..... T. D. 1,000 ft.; drlg.
P. H. Wilson's No. 1 Edds, Sur. No. 210 ..... Location.

JIM WELLS COUNTY

J. Walsh et al's No. 1 W. D. Wade, 1,035 ft. NE line, 300 ft. NW line of N cor., Lot 1, Blk. C, W. H. Bode Sur. ..... T. D. 2,235 ft.; shut down.

KARNES COUNTY

Clayton & Pierce's No. 1 Barnett in the Alex Hunter Sur., 6 miles N of Karnes City ..... T. D. 2,916 ft.; drlg.
J. F. Morrissey et al's No. 1 Ragsdale, 660 ft. SW of C of NE line of 170-ac. farm in the McCouil Sur. ..... T. D. 1,650 ft.; drlg.
Dr. Hewitt's No. 1 W. E. Porter, 650 ft. from N line, 700 ft. from W line of 416-ac. tract in the Victor Blanco Sur., 8 miles SE from Runge ..... T. D. 2,700 ft.; shut down.
Hurlbut et al's No. 1 Newberry, 450 ft. SE and SW lines of Newberry 428-ac. tract, Carlos Martinez Sur. .... T. D. 1,640 ft.; drlg. shale.

KENDALL COUNTY

Borgett et al's No. 1 Haag, W. Avery Sur. ..... T. D. 1,110 ft.; shut down.
A. S. Mowinkle's No. 1 Kaston, 150 ft. from N line, 150 ft. from E line of tract, Sur. No. 724, 9 miles due W of Kendalia ..... T. D. 1,543 ft.; shut down.
Sitten et al's No. 1 Garvin, C of NE of D. L. Richardson Sur. in the D. L. Richardson Sur., 1 mile NE from Kendalia ..... T. D. 850 ft.; shut down.
Dickinson et al's No. 1 Edmonson, 150 ft. from S line, 350 ft. from W line of tract in the J. O. Blair No. 72 Sur., 1 mile NW from Kendalia ..... T. D. 40 ft.; spudded in and shut down.
Dixon Oil Co.'s No. 1 Ottmer Behr, W of H.T.&B.R.R. Sur., 3½ miles SE from Sisterdale ..... T. D. 2,290 ft.; drlg.
P. B. Sterling's No. 1 R. J. McCrocklin, 1,350 ft. from N line, 250 ft. from W line of the B. G. Owens Sur., 4 miles W from Kendalia ..... T. D. 1,144 ft.; drlg.
R. M. Perkins' No. 1 J. Lawhorn, Sec. 10, 2,475 ft. E line, 1,488 ft. S line ..... T. D. 705 ft.; fishing.
Permian Oil Co.'s No. 1 Boles, S.A.&M.G. Ry. Sur. No. 542½ ..... T. D. 500 ft.; fishing.
Hardy Sitton's No. 1 McMillan, south central part of 180-ac. lease, B. Williams Sur. ..... Location.
Abercrombie Oil Co. and Harrison Oil Co.'s No. 1 Kung, 900 ft. from E line, 1,900 ft. from S line of McCormack Sur. ..... Location.

KERR COUNTY

Evans et al's No. 1 Love Ranch, 100 ft. from S line Sur. 1,597, 1,000 ft. E of W line of J. Martinez No. 1,594 Sur. ..... T. D. 1,920 ft.; underreaming at 1,860 ft.

KLEBERG COUNTY

Bowen & Sarles' No. 1 Robert H. Simmons in the A. Houston Sur. No. 611, Sec. 7, King Subd., 150 ft. out of NW cor. of SW ..... T. D. 1,580 ft.; drlg. shale.

KINNEY COUNTY

Magnolia Pet. Co.'s No. 1 Whitehead-Wardlaw, 2,640 ft. W line and S line of Melton Valdes grant ..... T. D. 3,290 ft.; drlg.
Mardon Oil Co.'s No. 2 Jim Clamp ..... T. D. 1,389 ft.; standing.
A. Blume et al's No. 2 Herbst, 1,731 ft. W and S lines of Sur. in the Poindexter-Burns Sur. ..... T. D. 275 ft.; shut down.

KIMBLE COUNTY

Lindley Bros.' No. 1 Anderson, Sec. 178, Mubenger Sur.... T. D. 990 ft.; shut down.
C. L. Bryant et al's No. 1 Lambert, 7,700 ft. N and W lines of F. Lotta Sur. ..... T. D. 850 ft.; drlg.

LASALLE COUNTY

Fred W. Vals' No. 1 Coleman, 200 ft. from S and E lines of SW Sec. 514, B.S.&F. Sur. ..... Moving in rig

LAVACA COUNTY

Newton Oil Co.'s No. 1 Reeves, cor. of S line of Reeves tract, John Hueser Sur. ..... Building derrick.

LIVE OAK COUNTY

Jacob, Buzzini & Pickett, Inc.'s No. 1 C. E. Kay, in the Bridget Fadden Sur., 3 miles E from George West.. T. D. 650 ft.; drlg.
Houston Oil Co.'s No. 1 D. W. Snyder, 630 ft. from S line, 150 ft. from E line of Snyder tract, T. E. Garner Sur. ..... T. D. 558 ft.; waiting on cement.
O. Stailey et al's No. 1 Nichols, 2,000 ft. from W line, 500 ft. from S line in the Ayers Sur. ..... Location.
Illinois Exploration Synd.'s No. 1 Reeves-Brown, 1,300 ft. S of Sellers tract, 1,800 ft. E of Ry. ..... Derrick.
Penn Oil Co.'s No. 1 Lyne, 900 ft. to W line, 330 ft. from S line of Sec. 69, on Devonian block ..... T. D. 3,390 ft.; fishing.
Sid Keoughan's No. 1 C. E. Terrell, 6,000 ft. from N line, 1,000 ft. from E line, Dan O'Boyle Sur. ..... T. D. 447 ft.; resumed drlg.
Tul-Tex Oil Co.'s No. 1 L. Jacobs, 4 miles from N of Callihan Field ..... Location.

LEE COUNTY

Burt et al's (M. D. Rickett) No. 1 R. C. Sanders ..... T. D. 2,910 ft.; drlg. shale.
A. H. Wheeler and associates' No. 1 fee, 14 miles NE from McDade, Blk. 47, Donohoe Sur. ..... T. D. 1,630 ft.; shut down.
J. P. Perry et al's No. 1 W. H. Thomas ..... T. D. 1,115 ft.; drlg.

McMULLEN COUNTY

Mogul Pet. Co.'s No. 1 Martin, 150 ft. NW line, 150 ft. to SW line of E. Melon No. 212 Sur. ..... T. D. 632 ft.; drlg.
Sheree, Brodie and Emick's No. 1 Shiver, Henry Brewer Sur. ..... Spudded and shut down.

MAVERICK COUNTY

Rycade Oil Corp.'s No. 6 Chittim, 1,445 ft. from S, 320 ft. from W of Sec. 116, Blk. 7, I.&G.N. Sur. ..... T. D. 3,475 ft.; standing.
Rycade Oil Corp.'s No. 5 Chittim, 600 ft. W of No. 3 Chittim, 500 ft. E line, 325 ft. from S line of SE Sec. 115, Blk. 7, in the I.&G.N. Sur. ..... T. D. 5,350 ft.; shut down.
Rycade Oil Corp.'s No. 5 Sullivan, in C of Sec. 82, Blk. 7, in the I.&G.N. Sur. ..... T. D. 7,092 ft.; fishing.

MEDINA COUNTY

National Oil Co.'s No. 1 Howard, 1,750 ft. E of W line, 1,854 ft. N of S line of survey in the John George Sur. No. 9, 10 miles S of Dunlay ..... T. D. 1,645 ft.; standing.
Caldwell et al's No. 1 L. W. Burrell ..... T. D. 2,167 ft.; moving in heavier rig.
Donaldson Oil & Dev. Co.'s No. 2 Hillenmeyer, James Hillenmeyer No. 25 Sur., 500 ft. to E line of survey, 150 ft. to S line of N half of survey ..... T. D. 200 ft.; shut down.
Pat Armstrong's No. 1 Crawford, 1,389 ft. N line, 2,550 ft. E line of survey, 487.6 miles W of Devine ..... T. D. 2,500 ft.; fishing.
Lyuko Co.'s No. 1 Medina Valley Irrigation, 2,800 ft. to S line, 2,250 ft. to E line of E. Reisacher Sur. No. 509. T. D. 686 ft.; drlg. lime.
United North & South Dev. Co.'s No. 1 Little, S from D'Hanis and near S line of county ..... T. D. 3,100 ft.; standing.
Service Oil & Gas Co.'s No. 1 H. G. Henslee, 500 ft. from NW line, 400 ft. from NE line of 50-ac. tract, Valdez Sur. ..... Location.

MILAM COUNTY

Rheubotham & Tate's No. 1 Johnson, 325 ft. from N line, 350 ft. from W line of 40-ac. tract, D. Robinson Sur. ..... Derrick.

NUECES COUNTY

Independent Oil & Gas Co.'s No. 1 Baldwin, 330 ft. each way out of NE of the J. C. Russell Subd., Blk. 11, 3 miles W from Corpus Christi ..... T. D. 5,575 ft.; testing.
Houston Oil Co.'s No. 1 Comstock, 105 ft. N of C of tract. Spudded.
H. H. Weinert et al's No. 1 Mohle, 450 ft. S line, 450 ft. W line of Section 94 ..... Rigging up.
Houston Oil Co.'s No. 1 Joe Hunter, 607 ft. from W line, 165 ft. from S line, 75-ac. tract, Sec. 591 ..... Location.

REAL COUNTY

McGinley Corp.'s No. 1 Haby, C of SW Sec. 175 ..... T. D. 300 ft.; drlg.

SAN PATRICIO COUNTY

J. L. Kennedy's No. 1 McRae, 1,170 ft. NW of the C of the SE line of 500-ac. tract ..... T. D. 1,822 ft.; drlg. shale.
George B. Pickett's No. 1 Baldwin, 900 varas due E of Denton, 1,200 ft. S of the SE cor. of O'Neil Sur., Abstract 211 ..... T. D. 4,012 ft.; moving in heavy rig to go 6,000 ft.
Saxet Oil Co.'s No. 1 Carroll, 800 ft. N line, 130 ft. to W line, Lot 32-A, Sec. 32 of the fourth subd., Taft farms ..... Moving in tools.
Union Prod. Co.'s No. 4 Welder, 3,000 ft. N line, 4,500 ft. E line of tract in the E. Portillo Sur. ..... T. D. 4,746 ft.; reaming.
G. B. Peterman et al's No. 1 Crow, 150 ft. from S line, 170 ft. from W line of Sec. 24 of the Fulton-Coleman Pasture Lands, J. H. Paul Subd. ..... T. D. 4,045 ft.; shut down.
G. B. Peterman et al's No. 1 Foster, 150 ft. from E line, 1,420 ft. from N line of Blk. 5 of the Welder-Coleman-Fulton Subd., 3½ miles W from Sinton ..... Location.
LaFeria Oil & Gas Co.'s No. 1 C. C. Smith, in J. C. White Sur., 690 ft. to N line, 350 ft. to E line ..... T. D. 4,067 ft.; shut down.
Cosden Oil Co.'s No. 1 Powell, 330 ft. E line of 36-ac. tract in Section 32, Paul Subd., Coleman-Fulton Pasture Lands ..... T. D. 803 ft.; set casing.

STARR COUNTY

Kush Explin. Co.'s No. 1 Kelsey-Bass, 150 ft. to W line, 750 ft. to N line, Por. 75, Blk. 9 ..... T. D. 752 ft.; temp. abandoned.
J. L. Smith's No. 1 Welch, Perdernal Sur. ..... T. D. 1,000 ft.; drlg.
Virginia Oil Co.'s No. 1 Kelsey-Bass, 150 ft. to S line, 1,850 ft. to W line, Blk. 6, Por. 75, Courargo ..... T. D. 357 ft.; drlg.

TRAVIS COUNTY

Fox Oil Co.'s No. 1 W. Fuchs ..... T. D. 1,012 ft.; shut down.
Fort Bend Oil Co.'s No. 1 M. Engleman, 450 ft. N line, 150 ft. W line of 103-ac. tract, J. H. Denson Sur. ... T. D. 385 ft.; shut down.
Garfield Oil Corp.'s No. 1 Gentry, on Travis-Bastrop line ..... T. D. 1,597 ft.; abandoned dry.

UVALDE COUNTY

Phantom Oil Co.'s No. 1 Claudt, Sec. 611 ..... T. D. 2,670 ft.; shut down.
Waldrop & Welch's No. 1 E. R. Edmonds, 1,750 ft. NW, 7,200 ft. W of Sec. 71, in the A. Gomez Sur., 8 miles S of Uvalde ..... T. D. 1,193 ft.; moving in heavier rig.

VICTORIA COUNTY

The Texas Co.'s No. 1 A. M. McFadden, 1,550 ft. N and E lines of H. Bonny Sur. ..... T. D. 5,100 ft.; tested dry.

WEBB COUNTY

J. L. Elliott's No. 1 Esperanza Land & Stock Co., 950 ft. from N line, 2,231 ft. E line, Sur. 815 ..... T. D. 1,450 ft.; standing.

ZAPATA COUNTY

T. H. Ward's No. 1 Uribe, 150 ft. NW line, 150 ft. SW line, Blk. 8 Subd., Share 7, Partition No. 6, T. Uribe Partition of Jose V. Borrego Sur. ..... Rigging up.
B. F. Nixon's No. 1 A. Gutierrez, 170 ft. S line, 332 ft. E line, Lot 5, Blk. 8, Partition 10, Borrego grant .... T. D. 50 ft.; standing.
Penny Prod. Co.'s No. 1 Juan V. Cuellar, Jr., et al, 175 ft. NE line, 175 ft. SE line Poppas Subd., Porcion 33 and 34, Blk. 1, Sur. 2 ..... T. D. 1,375 ft.; drlg.
National Oil Co.'s No. 1-A Adams, 150 ft. N of No. 1, Blk. 4, Sec. 11, Adams Subd., Borrego grant ..... T. D. 1,000 ft.; drlg.
National Oil Co. of Delaware's No. 1 Luther, 617 ft. NW line, 96 ft. NE line, Blk. 97, Da Prom Subd., Porcion 6 ..... T. D. 380 ft.; drlg.
National Oil Co. of Delaware's No. 2 Luther, 64 ft. NE line, 272 ft. SE line, Blk. 13, Sur. No. 7, Share 8, Borrego grant ..... T. D. 689 ft. (corrected); drlg. plugs.
Mackinzie and Tallmadge's No. 1 Trevino, 400 ft. SE line, 200 ft. NE line, Blk. 6, Sur. No. 4, Porcion 2 and 3 ..... T. D. 30 ft.; standing
F. M. Blair & Son's No. 1 Gutierrez, 150 ft. from NW line, 660 ft. from SW line, Blk. 2, Blair Subd., Comitas grant ..... T. D. 1,625 ft.; coring.
Lincoln Oil & Gas Co.'s No. 1 Gutierrez, Blk. 23, Subd., La Huerta grant ..... T. D. 1,150 ft.; drlg.
J. J. O'Hern's No. 1 S. Benavides, 150 ft. from NW line, 150 ft. from NE line, Blk. 10, Fansler Subd., Villa grant ..... Location.

ZAVALA COUNTY

Ed Anglin's No. 5 Pryor ..... T. D. 1,034 ft.; drlg.
Texas Gas Utilities Co.'s No. 1 Ike T. Pryor, Jr. ..... T. D. 1,211 ft.; tested gas, estimated 20,000,000 ft.
Ed Anglin's No. 6 La Pryor ..... Location.
Carl Cromwell's No. 1 Whitecotton, C of NW Sec. 1, A.P.&M. Sur. ..... Location.

OKLAHOMA FIELDS

(Continued from Page 42)

velopment in the Carr City area, was shot with 30 quarts. The oil filled up 2,000 feet in the hole after the shot. The Wilcox sand was found at 4,125-40 feet. Gypsy Oil Co.'s No. 4 Coker, NE cor. NW SW, Section 2-8-5, swabbed 437 bbls. in 24 hours from the Wilcox sand at 4,170-83 feet. Deeper pay will be sought in the well and it will be the first test in the extension to be drilled to the second Wilcox sand. Carter Oil Co.'s No. 4 Coker, SW cor. NW SE, Section 2-8-5, has been put on the air-gas lift and it made 140 bbls. the first three and one-half hours.

Kay County Test

Continental Oil Co.'s No. 1 Fruits, NE cor., Section 3-25-2w, Kay County, west of the Tonkawa Field, was plugged back 40 feet to a total depth of 4,440 feet, and after two shots the gas increased from 6,000,000 feet to 9,000,000 feet. The oil production increased from 10 to 13 bbls The Alco Royalty Co.'s No. 1 Wolfe, SE cor., Section 34-26-2w, Kay County, may be drilled deeper in the chat from a total depth of 4,390 feet, where it is making 4,500,000 feet of gas with a spray of oil. Another wildcat test in the same county is the Boucher Oil Co.'s No. 1 Jefferson, NE cor. SW, Section 32-26-1w, Kay County, which has collapsed casing at 1,172 feet. Flynn-Morgan's No. 1 Jones, SW cor. NE, Section 22-20-5, Pawnee County, had a hole full of water in sand at 3,414-40 feet, and was drilling in the Mississippi lime at 3,620 feet.

Wildcat tests in Grant County are drilling to the deep horizons. Bu-Vi-Bar Petroleum Corp.'s No. 1 Hurst, SW cor., Section 25-26-5w, in the central part of the county, was drilling in Mississippi lime at 5,440 feet. Consolidated Gas Co.'s No. 2 Forsythe, SE cor. NW, Section 2-27-3w, in the Armour Webb Pool, was drilling at 2,500 feet. Same company is drilling deeper its No. 1 Seacat, in Section 35-28-3w, which is making 6,000,000 feet of gas from a total depth of 4,127 feet.

Wanette Producer

Gypsy Oil Co.'s No. 1 Horn, SW cor. NW NE, Section 23-6-3, a new producer in the Wanette Pool, in southern Pottawatomie County, made 455 bbls. of oil in three hours after drilling out the cement plugs, and was then shut in to erect tankage. The total depth of the well is 3,468 feet in sand.

Oklahoma City's Shut-in Production

The initial production of the shut-in wells in the Oklahoma City Field that have been allowed to produce for 24 hours or less as of October 11 was 705,075 bbls. from 186 wells. These wells are now shut in for the proration period. The initial production and the approximate date on which each well will be opened for its regular producing period follow:

I. T. I. O.:	No.	Bbls.	Hrs.	Date
Boulevard	1	891	14	10-13
Huffman	1	3,015	..	10-12
R. Hemmer	1	1,340	18	10-20
Ferndale Com.	4	5,966	5	10-20
Pasadena Heights	2	2,626	12	10-19
State Land	5	3,524	16½	10-18
S. Peterson	6	10,356	19¾	10-17
C. Trosper	4	482	½	10-30
Mid Texas	1	4,864	18	10-30
Coppenger	5	3,465	20	10-20
Starkey	1	716	12	10-30
M. Unsell	3	1,399	14½	10-30
Capshaw	1	740	15⅝	10-23
Habegger	2	3,036	18	10-23
E. W. Jones	3	15,885	18	10-23
B. Johnson	7	1,400	Est.	11- 6
C. Trosper	3	4,000	Est.	11- 6
S. Peterson	7	6,612	22	11- 5
Carrico	2	3,497	16	11- 4
Eacock	1	1,351	16	11- 4
Handel	1	1,824	16	11- 4
S. Peterson	8	4,396	22	11- 4
E. Williams	1	4,132	17	11- 3
Brown	1	3,705	13	11- 3
Johnson	8	581	14	11- 2
M. Sudik	10	24,000	Est.	11- 9
R. Hemmer	2	4,000	Est.	11- 9
Coppenger	6	4,400	Est.	11- 9
Corff	4	941	3	11- 8
Coppenger	7	1,582	15	11- 8
Coppenger	2	515	12	11- 8
Johnson	6	2,388	10¼	11- 8
M. Unsell	4	96	½	11- 7
Mt. Vernon	1	909	16	11- 7
M. Unsell	6	3,666	..	11- 7
Spillman	4	5,451	10¼	11- 7
Precure	2	5,977	18	11- 6
Eacock	2	3,079	..	11- 6
Theimer	6	1,993	..	11- 6
Salsman	5	273	..	11- 6
Phelan Addition	1	2,000	Est.	11-19
H. G. Trosper	4	1,625	5	11-19
Jones Community	4	1,632	16	11-19
L. Jones	12	3,875	16	11-18
M. Knox	4	274	½	11-17
Magnolia Heights	1	2,814	16	11-18
Precure	1	1,393	5	11-18
J. Corff	5	3,827	16	11-18
Frendal Com.	5	3,500	Est.	11-26
Starkey	2	4,202	16	11-26
H. G. Trosper	7	7,200	Est.	11-26
Funk	1	6,036	16	11-26
Sudik	11	16	1¼	11-24
Carrico	3	366	(†)	11-23
Coppenger	3	507	16	11-22
Theimer	7	1,190	14	12- 1
Carrico	5	1,335	15	11-28
Corff	2	812	16	11-28
State Land	8	1,114	2	12-16
E. G. Trosper	5	118	8	12-15
Johnson	1	2,066	16	12-14
Spanagle	1	5,475	7¾	12-12
Lemon	1	2,400	Est.	12-11
Okla. State	7	5,407	16	12-12
Coppenger	8	1,980	14	12-10
M.-K.-T.	3	1,000	Est.	12-10
Lawton	1	1,721	16	12-10
Lawrence Place	2	5,644	16	12- 9
Corff	3	965	16	12- 8
Wheeland	1	4,083	9½	12- 7
Ivanhoe	1	383	½	12- 4
W. Franklin:				
Page	2	262	..	10-29
Theimer	7	5,077	16	10-16
Theimer	11	6,528	1¼	10-30
Lowery	9	8,756	16½	10-26
Wright	3	6,796	10¼	11- 3
Theimer	13	4,098	16	11- 8
Holden	2	2,092	12	11-19
Wright	2	7,000	Est.	11-17
Theimer	10	1,127	13	11-18
Lowery	10	746	1¼	11-18
Theimer	12	3,863	16	11-24
Page	4	2,707	16	11-24
Lowery	11	3,597	16	11-24
Theimer	9	2,987	4	11-22
Birge	1	2,546	16	12- 9
Page	5	6,502	16	12- 8
Theimer-Butterfield	1	1,800	12¼	12- 6
Cromwell:				
Trosper Park	25	960	2	10-20
Trosper Park	27	187	¼	10-19
Trosper Park	26	6,589	15¼	12- 1
Sinclair:				
School Land	5	3,808	6	10-24
Vincl	15	175	⅛	10-19
Vincl	10	340	4	10-18
Vincl	13	429	16⅛	11-19
Coline:				
Clauer	12	1,401	..	10-18
Clauer	7	968	20	10-17
Clauer	14	427	..	11-22
Blick:				
Page	1	3,433	21	10-13
Page	3	1,090	5	10-20
Frost Heights	1	3,987	19¾	10-18

(Continued on Next Page)

	No.	Bbls.	Hrs.	Date
Frost Heights	2	..	..	....
Alexander	1	330	2	10-19
Campbell	1	13,875	8	10-30
Foote	2	464	2	11- 4
Atkinson	1	11,340	18	10-26
Trumbley	1	2,611	18	10-26
Frost Heights	4	4,368	19¾	11- 4
Baker	3	3,155	13	11- 3
Atkinson	2	10,338	18	11- 2
C. C. Frost	1	1,097	9½	11- 5
Houston	1	582	2	11- 9
Moore	1	1,333	14	11- 8
Classen	2	9,644	10¼	11- 6
Alexander	2	987	10¾	11- 6
Gleason	1	3,302	16	11-19
Miller	1	2,011	14½	11-19
Danruthers	3	2,026	14	11-19
Frost Heights	3	97	½	11-19
Harrison	1	1,895	16	11-23
Thornton	2	294	24	12- 2
Thornton	1	383	½	12- 2
Classen	3	9,140	4¼	12- 2
Key	1	245	15	11-30
Danruthers	1	740	10½	12-15
Wilson	1	2,231	1	12-12
Classen-Edwards	1	13,933	6½	12- 6
Hall & Briscoe:				
Holmes	3	7,201	9	10-20
Holmes	2	4,032	6	10-20
Holmes	5	67,000	Est.	11-18
Lindsey	3	48,000	Est.	11-23
Muller	1	2,260	1½	12- 7
Phillips Pet. Co.:				
Carey	1	135	1	11-29
Prairie:				
Sigmon	5	4,240	6	10-30
Sigmon	7	2,565	16½	10-24
Sigmon	6	2,070	4	11- 8
Sigmon	2	2,580	4	11- 8
Sigmon	3	1,595	16	12- 5
Plains & Denver:				
Boulevard	1	4,968	..	10-13
Sadler	1	450	1¼	11-19
Schillings	1	6,500	Est.	11-26
Century Pet. Co.:				
Wyatt	*1	3,000	Est.	10-14
Barr	1	3,933	7¾	11-19
Jefferson	1	535	½	12-14
Independent:				
Hatcher	1	5,339	..	10-18
Harrell	1	1,150	13	11- 2
Lybrand	1	5,495	2¾	12- 1
Julian:				
Community	1	4,364	..	10-18
Hauser	1	3,600	Est.	10-20
Walker	1	2,263	2½	12- 2
Skelly Oil Co.:				
Dillon	2	4,640	12	10-23
Ainsworth	4	3,645	12	10-30
Tanner	1	2,790	12	11- 3
Ainsworth	3	1,115	11¼	11- 4
Ainsworth	2	1,665	8	11- 4
Tanner	2	17,807	11	11- 9
Dillon	1	1,624	6	12- 9
Hurt	1	5,322	1½	12- 6
Mabee & Blackstone:				
Harvey	1	675	3	10-25
Schillings	1	28,000	Est.	11-26
Rusty	1	1,807	1¼	11-23
Marco Oil Co.:				
Holder	1	2,600	18	11- 2
Anderson & Prichard:				
Pest House	1	10,165	21	11- 3
Roosevelt	1	10,000	Est.	11- 6
Pest House	2	1,090	2	11-19
Wilson	1	710	4	11-23
Graham	1	1,960	12	11-22
Keys	1	875	3	11-21
Gibson	3	15,000	Est.	11-26
Roosevelt	4	1,974	3	12- 2
Roosevelt	3	6,015	9	12- 1
Orphanage	1	910	12	11-30
Roosevelt	2	6,616	9½	11-29
Habegger	1	335	1	12- 8
Roosevelt	5	375	1½	12- 7
Champlin Oil & Ref.:				
McKeehan	1	4,480	11½	11- 6
Jones & Blackwell O. & G.:				
Townlot	1	10,000	Est.	10-25
Continental Oil Co.:				
Sudik	2	320	..	11-18
Mid-Kansas O. & G.:				
Mollman	4	3,254	16	11-19
Minnehoma:				
Pugh	1	22,746	9	11-23
Blackwell:				
Clemen	1	3,080	16½	11-25
Phillips Pet. Co.:				
Carey	1	2,400	Est.	11-26
Velt	1	5,705	10¾	12-14
Gant & Garvin:				
Harris	1	2,210	19½	11-30
Oil, Inc.:				
Ross	1	13,200	3½	12-11
Jack Shaffer:				
Vinita Park	1	620	1¼	12-15
Total	186	705,075		

*Wells producing from the Silicious lime. All others are producing from the Simpson sand. †Pick up oil.

Oklahoma City Oil Shipments

The total shipments from the Oklahoma City area were considerably under the previous weeks. The total shipments were 584,447 bbls. The daily average shipments were as follows:

Company—	Bbls.
Empire	20,228
I. T. I. O.	3,639
Magnolia	9,767
Oklahoma	12,025
Prairie	14,197
Stanolind	17,389
Sinclair	2,113
Shell	263
Tidal	2,591
Capitol	357
Century	573
Healdton	351
Total	83,493

Greater Seminole Oil Shipments

The pipe line shipments from the Greater Seminole area declined approximately 4,000 bbls. a day from the previous week for the week ending October 6. The total shipments were 188,340 bbls. a day. The daily average shipments from the various pools were as follows:

Company—	Seminole (bbls.)	Asher, Pearson, St. Louis (bbls.)	Konawa (bbls.)
Barnsdall	2,117	....	....
Continental	None	....	....
Consolidated	....	3,026	....
Cosden	6,328	....	5,950
Deep Rock	2,866	421	....
Empire	4,112	....	....
Independent	....	2,239	....
Gulf	14,689	2,038	411
Magnolia	6,433	6,426	....
Oklahoma	20,834	285	405
Prairie	14,759	5,141	3,557
Shell	3,769	462	1,266
Sinclair	28,563	7,276	4,087
Texas	6,789	2,111	2,613
Tidal	9,144	3,822	....
White Oak	1,685	....	....
Total	133,462	33,247	18,897
Tank cars	2,734		
Grand total	136,196		

Caddo County

English Drilling Co.'s No. 1 Berry, SW cor. SE SW NE, Section 31-6-9w, has been completed for 17 bbls. in sand 3,287-3,324 feet. Mid-Kansas Oil & Gas Co. and Ramsey Petroleum Co.'s No. 2 Surbeck, SE cor. SW SW, Section 2-5-9w, made 130 bbls. from sands 3,924-64 feet and 3,987-93 feet.

Carter County

Anderson and others' rig is up for No. 6 Eaves, NE cor. NW SW, Section 24-1s-3w. M.G.R. Oil Co.'s No. 2 Mitchell, SE cor., Section 24-1s-3w, is a rig. Walter Gant and others' No. 1 Meeks, SW cor., Section 19-1s-2w, swabbed 200 bbls. from sand 2,157-2,226 feet and 2,246-81 feet. Magnolia Petroleum Co.'s No. 3 Hooks, NW cor. SW NE, Section 24-1s-3w, Tatum Pool, has been completed for 600 bbls. in sand 2,012-56 feet.

Creek County

Tidal Oil Co.'s No. 2 Pigeon, NE cor. SE NE, Section 36-19-7, is spudding. Gled Oil Co. moved a machine in for No. 2 Bruner, NW cor. SW NW, Section 31-19-8. O. M. Irelan has the rig up for No. 1-A Collins, SE cor. SW SE, Section 4-17-11. Deep Rock Oil Corp. and Billingslea's No. 3 Lewis, NE cor. SW SW, Section 10-15-18, is preparing to deepen. Magnolia Petroleum Co.'s No. 6 Emarthla, SE cor. NE SW, Section 5-16-8, has been completed for 2,000,000 feet of gas in sand 2,785-2,884 feet. Sidwell Drilling Co.'s No. 1-A McGilbray, SW cor. NE NE, Section 30-14-8, made 25 bbls. from sand 3,548-71 feet.

Garvin County

C. R. Obermeyer's No. 1 Stricklin, NE cor. SW, Section 10-4-3, has been abandoned at 2,880 feet.

Grady County

Meridian Gas Co. made location for No. 3 Kinnard, CWL SE NE, Section 36-4-8w.

Hughes County

McGee and others' No. 2 Tiller, NE cor. NW NW, Section 12-9-10, is drilling at 500 feet. Gilcrease and others' No. 1 Haskett, SW cor. NE SW, Section 15-7-8, is dry and abandoned at 3,476 feet.

Latimer County

LeFlore County Gas & Electric Co.'s No. RO-14 Morrison, NE cor. SW SE, Section 1-6-22, has been completed for 12,000,000 feet of gas in sand 1,918-2,196 feet.

Marshall County

Goddard Oil Co. has a machine on the location for No. 1 Marshall, SW cor. SE SW NE, Section 8-6s-6. Magnolia Petroleum Co.'s No. 4 W. Rutland Co., CSL SE SE NW, Section 30-5s-6, is pumping 10 bbls. from sand 624-29 feet. R. L. Keener's No. 2 Monday, SW cor. NE, Section 4-6s-6, is a dry hole at 820 feet. George L. Pace's No. 1 Hicks, SW cor. NW, Section 8-6s-7, has been abandoned at 1,547 feet.

Muskogee County

Beland Oil Co.'s No. 10 H. James, NW cor. SE SE, Section 18-14-17, is drilling at 1,366 feet. J. M. Foltz' No. 5 Spaulding, SW cor. SE NE SW, Section 9-15-18, has been completed for 20 bbls. in sand 1,019-30 feet. Hale & Reynolds' No. 2 M. Sango, NE cor. SW NW, Section 9-15-18, is dry and abandoned at 930 feet. M. S. Mussellem's No. 1 Mary Sango, SW cor. NE, Section 17-15-18, has been abandoned at 1,275 feet. J. P. Flannagan's No. 4 M. Foreman, SE cor. SW SE NW, Section 14-13-18, is dry and abandoned at 1,255 feet.

Oklahoma County

Indian Territory Illuminating Oil Co. staked location for No. 1 Terrace Lawn, CNL NE, Section 10-11-3w, Oklahoma City Pool. Plains Petroleum Co. has the rig up for No. 1 Hatfield, SW cor. SE NW, Section 10-11-3w. Phillips Petroleum Co. has the cellar dug for No. 1 Bouldinghouse, SW cor. NE NE NW, Section 10-11-3w. Skelly Oil Co. and others' No. 1 Dillon, NE cor. SW, Section 2-11-3w, made 4,437 bbls. in 16 hours from sand 6,185-6,222 feet. Wirt Franklin Petroleum Corp.'s No. 1 Birg, NE cor. NW SE, Section 2-11-3w, has been completed in sand 6,482-87 feet for 2,546 bbls. in 16 hours. Skelly Oil Co. and Heenan & Coe's No. 1 Tanner, NE cor. SE SE NE, Section 10-11-3w, has been completed for 6,257 bbls. in sand 6,260-78 feet. Indian Territory Illuminating Oil Co. and others' No. 3 Corff, SE cor. SW SW, Section 11-11-3w, has been completed for 965 bbls. in 16 hours from sand 6,315-6,576 feet. No. 1 M. Lawton, NE cor. SW NE, Section 11-11-3w, has been completed for 1,721 bbls. in 16 hours from sand 6,280-6,578 feet. No. 1 E. Precure, SW cor. SE SE, Section 11-11-3w, has been completed in sand 6,290-6,472 feet for 4,228 bbls. in 16 hours. Wirt Franklin Petroleum Corp.'s No. 1 Theimer-Butterfield, NW cor. NE NE, Section 11-11-3w, made 2,355 bbls. in 16 hours from sand 6,351-6,529 feet. No. 1 E. Williams, NW cor.

SUMMARY OKLAHOMA FIELD

A survey of the Oklahoma City Field as of October 10 shows the progress of the development which is believed to be nearing completion. A total of 802 operations including locations and rigs and completed wells are under way in the field. The field has an actual number of 120 operations under way at this time. These are divided as follows: 13 producers were being reconditioned, 24 were drilling under 5,000 feet, 16 were drilling between 5,000 and 6,000 feet, 44 were drilling 6,000 feet and over, 23 were waiting for cement. Wells are being completed on an average of two a day. A total of 589 operations were completed in the field as oil wells and 23 as gas wells. A total of 58 are rigs and locations. A list of the different companies and the status of their operations are as follows:

Operators—	Total	Wells shut down	Waiting on cement	Drilling less than 5,000 feet	Drilling between 5,000-6,000 feet	Drilling less than 5,000 feet	Locations, R.U.R. and rigs	Producers being worked over	Gas wells	Oil wells
I.T.I.O.	246	15	11	12	3	1	17	9	5	369
I.T.I.O.-Cromwell-Franklin	23	0	0	0	0	0	0	0	0	23
Cromwell-Franklin-I.T.I.O.	25	0	1	0	1	0	5	0	0	32
Wirt Franklin	29	0	0	0	0	2	1	2	0	34
Sinclair	51	0	1	1	0	1	3	0	0	57
Cunard Oil	0	0	0	1	0	0	0	0	0	1
Champlin Refining	2	0	0	2	0	0	0	0	0	4
V. A. Kedney	0	0	0	1	0	0	0	0	0	1
Coline Oil	33	1	0	0	0	0	0	0	0	34
Phillips Petroleum	4	0	0	10	5	3	2	2	0	27
Slick-Atkinson	24	0	0	0	0	0	2	1	0	27
Slick	30	0	0	0	2	0	3	1	0	36
Slick-Kelly	2	0	0	0	0	0	0	0	0	2
Prairie-Slick-Phillips	6	0	0	0	0	0	0	0	0	6
Anderson-Prichard	14	0	0	2	0	0	0	3	0	19
Indian State Oil	0	0	0	3	0	0	0	0	0	3
Tiger State Oil	0	0	0	1	0	0	0	0	0	1
Continental Oil	3	0	0	1	0	0	1	1	0	6
Hall-Briscoe	9	0	0	1	2	2	0	0	0	14
Don Leon Oil	0	0	0	0	1	0	0	0	0	1
Oils, Inc.	1	0	0	3	0	0	1	0	0	5
Plains Petroleum	2	0	0	1	2	0	0	0	0	5
Russell Petroleum	0	0	0	0	0	1	0	0	0	1
Capitol Producing & Refining	0	0	0	0	1	0	0	0	0	1
Denver Producing	1	0	0	1	0	0	0	0	0	2
Skelly	18	0	0	0	0	1	1	0	0	20
Capitol City Oil	0	0	0	1	0	0	0	0	0	1
Gant-Garvin	0	0	0	2	1	0	1	0	0	4
Mid-Kansas	11	1	0	0	0	0	0	0	0	12
Minnehoma Oil	1	0	0	0	0	0	0	0	0	1
Scott & Co.	0	0	0	1	0	1	0	0	0	2
H. B. VanHooser	0	0	0	1	0	0	0	0	0	2
Prairie Oil & Gas	0	0	0	0	0	0	0	2	0	2
Jack Shaffer and others	1	0	0	0	0	0	1	1	0	3
Capitol Production Trust	0	0	0	0	0	0	0	0	1	1
Century Petroleum	3	0	0	0	0	0	0	0	0	3
Century-Spears	0	0	0	1	0	0	0	0	0	1
J. H. Gwin	0	0	0	1	1	0	0	0	0	2
Empire Oil & Refining	0	0	0	2	0	0	0	1	0	3
Traders Oil	0	0	0	1	0	0	0	0	0	1
Briggs Oil	0	0	0	1	0	0	0	0	0	1
Oklahoma City Petroleum	0	0	0	0	1	0	0	0	0	1
Jones Brothers Drilling	0	0	0	1	1	0	0	0	0	2
Cargill Brothers, Inc.	0	0	0	1	0	0	0	0	0	1
Government Petroleum	0	0	0	0	0	0	1	0	0	1
Kedberg Oil	0	0	0	0	0	0	1	0	0	1
Blackstock & Mabee	1	0	0	1	0	0	0	0	0	2
California Operating	0	0	0	0	0	1	0	0	0	1
Mid-Texas Petroleum	0	0	0	1	0	0	0	0	0	1
Keene-Oklahoma	0	0	0	0	1	0	0	0	0	1
Pace Petroleum	0	0	0	0	0	1	0	0	0	1
Deusch & Dietz	0	0	0	1	0	0	0	0	0	1
Independent Oil & Gas	3	0	0	1	0	0	0	0	0	4
Great Southern Petroleum	0	0	0	1	0	0	0	0	0	1
Ivanhoe Oil	0	0	0	1	0	0	0	0	0	1
Huddleston & McKeehan	0	0	0	1	0	0	0	0	0	1
Morgan Petroleum	0	0	0	0	0	0	0	1	0	1
Wrightsmith Oil	1	0	0	0	0	0	0	1	0	2
Acme Gas & Oil (L)	0	0	0	0	1	0	0	0	0	1
British-American	0	0	0	0	0	0	1	0	0	1
J. E. Mabee	2	0	0	0	0	0	0	0	0	2
Jones Brothers-Blackwell Oil	1	0	0	1	0	0	0	0	0	2
Slick-I.T.I.O.	1	0	0	0	0	0	0	0	0	1
Pasteur-Jordon	0	0	0	1	0	0	0	0	0	1
Shell Petroleum	9	0	0	0	0	0	0	0	0	9
Slick-Aladdin-Phillips	2	0	0	0	0	0	0	0	0	2
Heenan-Coe	2	0	0	0	0	0	0	0	0	2
Slick-Anderson-Prichard	10	0	0	0	0	0	0	0	0	10
Mid-Texas	1	0	0	0	0	0	0	0	0	1
Sinclair-Amerada	4	6	0	0	0	0	0	0	0	10
Prairie-Slick	7	0	0	0	0	0	0	0	0	7
Reynolds-Unruh	1	0	0	0	0	0	0	0	0	1
Marco Oil	1	0	0	0	0	0	0	0	0	1
C. C. Julian Oil	3	0	0	1	0	0	0	0	0	4
Independent-Phillips	0	0	0	1	0	0	0	0	0	1
Glidden Oil	0	0	0	1	0	0	0	0	0	1
Oil State Petroleum	0	0	0	1	0	0	0	0	0	1
McArthur Oil	0	0	0	1	0	0	0	0	0	1
M. K. and Irbey Owenby	0	0	0	1	0	0	0	0	0	1
Nicoma Park District	1	0	0	0	0	1	0	0	0	2
Wildcats	0	0	0	1	0	1	2	0	4	8
Total	589	23	13	58	24	16	44	22	12	802

SE NE NW, Section 23-11-3w, had sand 6,310-6,650 feet, plugged back to 6,601 feet and made 5,353 bbls. Indian Territory Illuminating Oil Co.'s No. 9 Johnson, NW cor. SE NW, Section 25-11-3w, made 2,066 bbls. on a 16-hour gauge, producing from sand 6,250-6,510 feet. Wirt Franklin Petroleum Corp.'s No. 5 Page, CSL SE SE, Section 35-12-3w, has been completed for 6,502 bbls. in 16 hours from sand 6,230-6,454 feet. Indian Territory Illuminating Oil Co.'s No. 7 Oklahoma State, NW cor. SE NW, Section 36-11-3w, made 5,440 bbls. on a 16-hour gauge from sand 6,585-6,678 feet. Indian Territory Illuminating Oil Co. and others' No. 1 Mary Sudik, NE cor. SW, Section 31-11-2w, has been completed for 30,978 bbls. from sand 6,450-70 feet.

Okmulgee County

A. W. Cline's No. 2-A D. Harrison, C SE NW, Section 19-15-14, is drilling at 150 feet. F. D. Misener's No. 5 J. Colbert, NE cor. SE SE, Section 15-14-14, is spudding. Trout Drilling Co.'s No. 6-A Mayfield, CEL SW SW, Section 20-16-14, has been abandoned at 1,720 feet.

Osage County

A. G. Oliphant's No. 3, NW cor. SE NE, Section 10-21-8, is rigging up. The Texas Company and others' No. 4, NW cor. SE NE, Section 11-21-11, is an old well rigging up to deepen from 1,846 feet. Peters Petroleum Corp. and Producers & Refiners Corp.'s No. 1, SE cor. NE, Section 22-27-11, has been abandoned at 1,740 feet. Indian Territory Illuminating Oil Co.'s No. 438, SE cor. SW, Section 15-25-12, has been completed for 7,000,000 feet of gas in Wilcox sand 1,760-61 feet. No. 439, NW cor. SW, Section 36-24-8, made 700,000 feet of gas in sand 220-21 feet. Corona Oil Co.'s No. 19, SW cor. NW NW, Section 13-23-8, is dry and abandoned at 2,200 feet.

Pawnee County

Johnson Oil & Refining Co. and others' No. 1 Mills, NE cor. SE NW SE, Section 35-20-9, is a machine moving in. Peter Adamson, Jr.'s No. 1-A Moore, CEL SE SW, Section 24-21-7, has been completed for 25 bbls. in Layton sand 1,158-63 feet.

Pottawatomie County

Atlantic Oil Producing Co. made location for No. 2 Morgan, SW cor. SE, Section 4-7-4, North St. Louis area. Pure Oil Co. has the rig on the ground for No. 2 Case, SE cor. SW, Section 14-6-3, West Asher Pool. Indian Territory Illuminating Oil Co. has the cellar dug for No. 7 Davidson, SW cor. SE NW, Section 23-6-3. Wilcox Oil & Gas Co.'s No. 7 Warren, NW cor. NE SW, Section 23-6-3, is a cellar. Magnolia Petroleum Co.'s No. 2 Wood, SE cor. NE SW, Section 29-6-6, Konawa Pool, is rigging up. Indian Territory Illuminating Oil Co.'s No. 5 Davidson, NE cor. SE NW, Section 23-6-3, has been completed for 2,077 bbls. in sand 3,461-89 feet. The Prairie Oil & Gas Co.'s No. 3 Tomlin, SE cor. NW NW, Section 23-6-3, has been completed for 345 bbls. in 11 hours from sand 3,473-3,514 feet. No. 6 Tomlin, NE cor. NW, Section 23-6-3, made 2,510 bbls. from sand 3,555-80 feet.

Tulsa County

Burkhart and others moved a machine in for No. 1-B Roberts, NW cor. NE NE, Section 30-19-12.

Seminole County

Gypsy Oil Co. has the cellar dug for No. 6 Coker, SW cor. NW SW, Section 2-8-5, Carr City Pool. Pyramid Oil Co. made location for No. 1 Patterson, NW cor. NE NW SW, Section 17-7-8, Holdenville Field. Mid-Continent Petroleum Corp.'s No. 7 P. Harjo, NW cor. SE SW, Section 20-6-6, Konawa Pool, has been completed for 855 bbls. in sands 2,853-65 feet, 2,888-96 feet and 2,925-33 feet. Harris and others' No. 1 Fleet, NW cor. SW NE, Section 29-6-6, swabbed 840 bbls. from sand 2,838-2,949 feet. Magnolia Petroleum Co.'s No. 1 Wood, NE cor. SW, Section 29-6-6, flowed 3,200 bbls. from sand 2,800-10 feet.

Stephens County

Harry Hanbury has the rig up for No. 1 Palmer, SE cor. NW SE, Section 31-1s-8w. Harris & McNeil's No. 1 Parker, SW cor. SE NE SE, Section 11-2s-8w, is rigging up.

Wagoner County

A. E. Carder's No. 4 J. Atkins, NW cor. NE SE, Section 25-18-15, has been deepened from 840 feet to 1,000 feet and shut down. Mays Drilling Co.'s No. 1 Kelly, NW cor. SW, Section 10-18-16, is drilling at 150 feet. J. H. Striker's No. 4 H. Drew, SW cor. SE NE, Section 19-18-16, is drilling at 680 feet. J. W. Edwards and others' No. 1 Chockley, SE cor. NE, Section 21-17-16, is drilling at 100 feet. F. L. Beam's No. 2 N. Davis, NW cor. NE SW, Section 22-17-16, is rigging up. Bowman and others' No. 1 Childers, NW cor. SW, Section 23-17-16, is rigging up. George Longacre and others' No. 2 Harris, NW cor. SW SW NE, Section 6-16-16, is a machine. Bailey and others' No. 1 Replogle, SW cor. NE SE NE, Section 31-19-16, has been completed for 25,000 feet of gas in sand 622-45 feet. J. W. Edwards and others' No. 1 G. Lovett, NW cor. SW NW, Section 22-17-16, has been completed for 20 bbls. in sand 898-903 feet. Brasheers and others' No. 2 E. Darnell, NW cor. SW, Section 12-17-17, has been abandoned at 290 feet. George Longacre and others' No. 1 Harris, NE cor. SE NW, Section 6-16-16, has been abandoned at 1,740 feet.

Garfield County

Washoma Petroleum Co.'s No. 1 Garber Refining Co., NW cor. NE SE, Section 25-23-4w, is a rig. Continental Oil Co.'s No. 1 Thorp, SE cor., Section 24-23-4w, found a hole full of water in sand at 5,260-77 feet and was abandoned.

Kay County

McComas' No. 1 Walker, CEL SE NE, Section 1-28-1w, was completed for 500,000 feet of gas at 674-75 feet. Same operator made a location for No. 2 Smith, C SE NE, Section 6-28-1.

Logan County

Blackwell Oil & Gas Co.'s No. 1 Knecht, NW cor. SW SE, Section 21-18-4w, was completed for 35 bbls. from sand at 6,000-20 feet, total depth 6,202 feet.

CANADIAN FIELDS

(Continued from Page 55)

No. 1, LSD 13, is reported making new hole at 5,043 feet. Mercury's No. 5 bottoming at 4,455 feet, and No. 7, at 1,900 feet, are working on casing. Mercury's No. 2 is making 46 bbls. a day and No. 3 making 219 bbls.

In the Central Turner Valley, Midfield Oil Co.'s No. 1, LSD 9, Section 1-20-3w5, is reported to have blown into production in the deep lime at 4,260 feet with a wet gas flow variously estimated from 12,000,000 to 20,000,000 feet a day. At this depth it was about 284 feet in the lime. At last reports the flow was being run through the separator and production test was in progress. Measurements showed the gas had increased to 21,000,000 feet and recovery was estimated between 200 and 300 bbls.

Imperial Drilling

Imperial Oil, Ltd.'s drilling campaign in the Turner Valley has been further extended by the spudding in recently of Mayland Oil Co.'s No. 4 in Section 17-19-2w5. At last reports it was down 49 feet. Mayland Oil Co. already has two producers in this section, No. 2 making around 225 bbls. a day. Mayland's No. 1, which started at around 60 bbls. a day, after a shot is reported to more than doubled its original production. Mayland's No. 3 is drilling at 5,726 feet. In the same section Lowery Petroleum's No. 2 is drilling at 2,334 feet.

In Section 20-19-2w5, South Turner Valley, Home Oil Co.'s No. 6 is drilling at 4,212 feet. Actual production of the Home wells in September aggregated 18,388 bbls. of naphtha and 475 bbls. of light crude, or about 615 bbls. a day from four producing wells, a 30-bbl. increase over the August production.

Central Turner Valley

In the Central Turner Valley, Section 1-20-3w5 is getting the limelight. In addition to the completion of Midfield Oil Co.'s No. 1, Okalta Oils' No. 1, LSD 1, has been brought back into large production. This well, originally good for around 500 bbls. with 30,000,000 feet of wet gas, was for a time completely frozen off, owing in part to collapsed and damaged casing. Swedging was started some time ago and was still in progress when the gas flow came back. Official measurements indicated 28,250,000 feet. Swedge and cables were lost in the hole and the force of the gas dislodged the crown gears. Crude naphtha recovery is reported back to around 250 bbls. or better. Okalta's No. 3, LSD 9, same section, is reported making 40 to 50 bbls. following a test of deep lime production at around 4,550 feet; it may later be shot, depending on results secured by Imperial Oil, Ltd., from a shot in Foothills' No. 2, a short distance away. Okalta's No. 2, LSD 8, has finished rigging up diamond drill from No. 3, and is resuming drilling in the lime at 4,852 feet; this test has already a small gas flow in the lime.

In the same section, Sioux City Oils' No. 1 deep test, LSD 10, is reported drilling below 5,850 feet, around 1,465 feet in the lime. The drill is working in a white lime horizon with further shows of oil, but no commercial production. At the present depth the test is close to establishing a record for deep lime drilling in the Turner Valley. McLeod Oil Co.'s No. 4 last year encountered a lower producing horizon in the lime at approximately this depth.

In Section 12-20-3w5, New McDougall-Segur Oil Co.'s No. 4, LSD 14, is reported making 70 bbls. a day from the lime at 5,030 feet. No. 3, same LSD, is resuming after cementing against caving at 5,424 feet. Though nearly 400 feet below No. 4, No. 3 test has not yet reached the lime. British Dominion's No. 2, same LSD, shipped 2,263 bbls. of crude naphtha, and total production up to the end of that month aggregated 25,185 bbls. of naphtha and 1,213 bbls. of light crude, with a total value of $92,617.36. Spooner Oils' No. 4, LSD 14, Section 13-20-3w5, is drilling 26 feet in the Dalhousie sand at 4,675 feet, after encountering a show of oil. Production from Spooner's Nos. 1 and 2 in September aggregated 4,033 bbls.

Deliveries from the Turner Valley Field to the Regal Oil & Refining Co. in September aggregated 11,905 bbls., an increase of 527 bbls. over August.

Ribstone Producer

In the Ribstone Field, eastern Alberta, Meridian Oils' No. 3, LSD 4, Section 16-45-1w4, has been drilled into the pay at 1,882 feet, and looks like the largest producer in the field. Meridian's Nos. 1 and 2 and the Imperial Oil's No. 2 Ribstone each have a reported production of 100 bbls. or better. Meridian's No. 3 proved to be higher on structure, and will do considerably better than any of the earlier wells. Oxville Oil & Gas Co.'s No. 1, LSD 15, Section 10-46-2w4, was abandoned some time ago after being drilled to 2,297 feet. This location was about 7 miles west of the Meridian group of producers. The Oxville company has since secured 11 subdivisions from Palmer Petroleums, Ltd., within about a mile of the Meridian wells, and is arranging to drill Oxville's No. 2. It is reported that the Darlington Oil & Gas Co. of Regina, Saskatchewan, which some time ago located a test on its Ribstone acreage in Section 34-46-28w3, is planning to start drilling at once. This location is on the Saskatchewan end of the Ribstone structure close to the international boundary.

Red Coulee Field

In the international Red Coulee Field, Inland Petroleums' No. 2, SE SW SW, Section 1-37-4w, on the Montana end of the structure, got commercial production in the Ellis sand at 2,515 feet. At 6½ feet in the sand the well turned into a gusher, gas pressure blowing the crude over the top of the derrick. At last reports a definite production test was being made. Before striking oil in the Ellis the drill passed through a gas sand where production around 2,000,000 feet was encountered. This gas is being taken between the 6-inch and 8-inch casing. Inland Petroleum's No. 1 is making around 40 bbls., the Ohio Oil Co. taking the production. Inland's No. 2 is two locations east of Inland's No. 1 and offsets Ohio Oil Co.'s No. 1 producer. It is a quarter mile south of the boundary. Drilling was handled under contract by J. W. Elliott, the test being financed by Alberta and British Columbia interests headed by A. M. Morrison of Coleman and A. M. Densmore of Lundbreck, Alberta. Ohio Oil Co. is expected to take production, though in view of the proration policy it may be marketed to Canadian buyers.

Hannah-Porter Oil Co.'s No. 2 Iowa, SE SE SE, Section 2-37-4w, is reported to have come in as a fair commercial producer.

On the Alberta end, Celtic Oils' No. 1, LSD 4, Section 17-1-16w4, is drilling below 2,100 feet and unofficially reported to have entered a promising oil sand. Production at this point would extend the field several miles north of the Vanalta group. Devonshire Oils' No. 1, LSD 3-4, Section 10-1-16w4, is drilling around 2,000 feet. Dalco Oil & Gas Co.'s No. 2, LSD 7, Section 19-2-17w4, is reported drilling below 2,000 feet after encountering additional shows of gas.

Border Fields

In the Spring Coulee area, Alberta Pacific Consolidated's No. 1, Section 15-4-23w4, is reported to have got through a very hard formation around 3,100 feet and is now working in a softer strata where the rotary mud shows traces of oil. Some gas has been met. Sheldon-Burden of Canada, Ltd., is handling the drilling contract, which calls for a test to 5,500 feet or the top of the lime.

Anglo-Western Oils' No. 1, LSD 1, Section 12-4-17w4, is reported spudding in, and Anglo-Western Oils' No. 2 has been located in LSD 16, Section 1-3-17w4.

In the Acadia Valley district, Fuego Oils' No. 1, Section 34-25-4w4, is producing a fair quantity of crude from a sand at 3,165 feet. The oil is being sold unrefined for fuel. The steady production is reported to have increased the gravity of the crude. Further development is being arranged, No. 2 test having been located some time ago.

In the Pincher Creek district, Weymarn Petroleum's No. 2, LSD 5, Section 7-6-1w5, is cleaning out after a shot at 2,000 feet and will set 10-inch casing above the gas sand and take the gas between that and 8-inch. The flow is estimated around 4,000,000 feet with a heavy naphtha content, the naphtha testing 87° Be.

Northern Alberta

On Paint Earth Creek, Hudson's Bay Oil & Gas Co.'s No. 1 Paintearth, LSD 5, Section 27-39-15w4, is reported drilling at 1,600 feet. In the Sullivan Lake area, a dozen or more test holes drilled by Alberta Pacific Consolidated Oils, Ltd., have resulted in the location of three structural highs. Test drilling will be continued, and the first commercial well started next spring.

British Columbia

In British Columbia, Baker & Anderson of Victoria, British Columbia, are reported starting a test 12 miles south of Fernie. "Red" Willey, formerly of Casper, Wyo., has charge of the drilling.

E. G. McKenzie and associates of Vancouver have located a test near Canyon Creek on the McCulloch Road about 9 miles from Kelowna. N. C. Janssen Drilling Co. of Seattle has the contract and preliminary work is now under way on the location.

Oil Rights Transferred

An important change took effect on October 1 when the transfer of the natural resources in the western provinces from the federal to the provincial governments formally took effect. The transfer affects oil and gas rights in Alberta, Saskatchewan and a limited area in British Columbia. It is of more particular interest to Alberta oil operators. R. G. Reid will be minister of lands and mines under the new arrangements; and administration work in connection with the mines branch will be carried on by a staff under direction of C. C. Ross, supervising mining engineer at Calgary for the next month, under an arrangement with the federal authorities.

A proposal has been made for a moratorium of one year in regard to leases on

which rentals have been paid for two years or more. It is claimed that as a result of financial conditions small leaseholders are unable to keep their leases in good standing. It has been the practice under federal control to allow amounts expended on actual development work to apply on rentals.

CALIFORNIA FIELDS

(Continued from Page 54)

eral new wells due to drilling operations on adjacent properties. This company is at the present time running seven strings of tools on the Babb, Nesa, Stakemiller and Patton leases. During the past week the company successfully finished No. 7 Stakemiller after redrilling and deepening it to 6,030 feet. This rejuvenated well, finished with a 6⅝-inch liner carrying 981 feet of perforated and 5,506 feet of 2½-inch tubing, was returned to production flowing 1,160 bbls. of clean 27.8 gravity oil. Ball & Barnes also finished a satisfactory completion this week when No. 1 Signal was returned to production flowing 1,040 bbls. of 29.2 gravity oil per day from 7,520 feet, the hole being open from this point up to 6,150 feet where the 6⅝-inch water string was landed and cemented. This well was given a preliminary production test last August after being redrilled and deepened to 7,022 feet, from which depth it was only good for 220 bbls. per day.

The Signal Oil & Gas Co. successfully completed its No. 1 Signal, a former upper zone producer in the Los Cerritos section of the Long Beach Field, and incidentally increased its daily production 1,150 bbls. of oil and 2,100,000 feet of natural gas per day. The Zenith Oil Co. also chalked up a satisfactory completion in Los Cerritos, or northwest extension of the Long Beach Field this week when its No. 1 Signal was brought in under a natural flow doing 710 bbls. per day. The Washington Petroleum Co.'s No. 1 Long Beach failed to result in a natural flow upon completion at 6,830 feet and it was accordingly put on the beam. It showed an initial pumping of 75 bbls. per day and was subsequently shut in because of an excessive water cut.

Midway-Sunset

Two wells were completed in the Midway-Sunset Field of Kern County during the past seven-day period, one of which was located out in the Maricopa Flats section. This was the Union Oil Co.'s No. 1 Son, which was good for 155 bbls. per day on the beam from 3,462 feet, the hole having been finished with a 4¾-inch liner carrying 175 feet of perforated. In the older section of the Midway-Sunset Field the Chanslor-Canfield Midway Oil Co. successfully completed its well No. 87 in Section 8-32-23. This new producer, bottomed at 2,890 feet, was brought in under a anutral flow doing 710 bbls. of 23.2 gravity oil per day. Out in the West Front area of the Kern River Field, the Chanslor-Canfield Midway Oil Co. finished well No. 36 in Section 23-28-27 pumping 200 bbls. of 16.7 gravity oil per day from 2,224 feet.

The Elwood Exploration Co. made a preliminary production test on its well No. 5, located on tideland permit No. 90, but failed to secure commercial production due probably to a defective water shutoff. This new well, which registered an initial of 625 bbls. per day cutting 25 per cent water, was subsequently killed and preparations are being made to run a water witch in order to locate the source of water. Under a new contract between the Barnsdall and Rio Grande and the Southern Counties Gas Co., natural gas from the Elwood Field of Santa Barbara County will be delivered to the Los Angeles metropolitan area for domestic consumption within the next 30 days. The first delivery is scheduled to be made November 14 and will continue for a period of 10 years, provided of course that sufficient gas production is secured to warrant operation of the new line now under construction from Elwood to Los Angeles. The volume involved varies during the first three years from approximately 2,590,000 feet per day to 3,625,000 feet per day for the third year and throughout the remainder of the contract. In order to make this gas available for consumption in southern California, the Southern Counties Gas Co. has already started construction of the 32-mile pipe line of 16-inch diameter from the Elwood Field to Ventura where it will hook into existing facilities.

The Barnsdall Oil Co. has killed No. 2 Trust, a new well finished in the Rosecrans Field of Los Angeles Basin last week, due to a defective water shutoff, and preparations are being made to recement. In the West Coyote Field of Los Angeles Basin the Standard successfully finished No. 103 Murphy Coyote pumping 288 bbls. of exceptionally clean 28.9 gravity oil per day in the upper zone at 4,390 feet. The Huntington Beach Field, after lying practically dormant for several years, is witnessing a revival of interest which has resulted in extensive leasing during the past few weeks. The Superior Oil Co., drilling two deep tests in this field, recently acquired several new leases in the western part of the field, presumably on showings found up to the present time. This leasing activity, together with the fact that the company has started construction work on a new natural gasoline plant, is generally accepted as evidence that the company has found good indications of the presence of new deep production. This, however, remains to be seen, as no confirmation is available.

SOUTHWEST TEXAS FIELDS

(Continued from Page 46)

the country has been pretty well punctured with dry holes.

In the area south of Seguin, Cranfill & Reynolds are in the Edwards and have sulphur water in the No. 1 Meyers and Guy Lewis' (H. H. Weinert) No. 1 Malone topped the chalk at 2,431 feet which did not seem encouraging. This also is a part of the country where the geology is very inviting to wildcatters and where many dry holes have been drilled.

Some new locations are being made in that country, however, for Adams & Lyles who have drilled some of the tests in the past are starting on a new one on the Seligman tract about 4 miles northeast of the Cranfill & Reynolds' No. 1 Meyers which has just been abandoned and about the same distance southeast of Seguin. In the northern part of the county Miller & Calhoun have not made much progress on No. 1 Linberger which is trying to get a core at 1,278 feet.

Kendall, Blanco, Edwards, Real and Kerr Counties, the counties on the north side of the fault line, have developed nothing of importance in the numerous wells drilling in that part of the country except a little additional depth.

Williamson County is still an active spot, Recent rains in that part of the country have furnished enough water so that many rigs which have been idle all summer due to shortage of water are now running again and completions will be reported.

MICHIGAN FIELDS

(Continued from Page 56)

NW SE SW, Section 2-14n-3w, Chippewa Township, Isabella County; the Stork Oil Co.'s No. 2 Sawade, in the same section, and the Pure Oil Co.'s No. 1 Burrows, in Section 3-14n-3w.

A further check on the prospects northwest of Broomfield Township will be known as soon as Lewis D. Mehrtens' No. 1 M. Baumann, in Section 21, Wheatland Township, Mecosta County, near Remus is nearing the Marshall. The Benedum-Trees Oil Co. recently completed a dry hole in Sheridan Township, Mecosta County.

In the Muskegon Area

A new structure test well will be started immediately on the property of C. L. Bullock, including the S half NW, Section 15-11n-17w, Fruitland Township, by the Reed Oil Co.

A permit for the new test, third to be drilled by the same company in Fruitland Township about 5 miles northwest of the Laketon Township area of the proved Muskegon Field, was granted last week by the state conservation department and a rig has been moved in to start operations.

The Blue Arrow Petroleum Co.'s No. 1 Workman, SW NE, Section 8-10n-16w, Muskegon Township, Muskegon County, on the Muskegon River Flats, has been cased at 1,976 feet and will be drilled into the Dundee formation after being shut down for several months.

The Muskegon Deep Well Syndicate's No. 1 Herman Heinz, NE NE, Section 8-10n-16w, Muskegon Township, first deep test in the proved field, has been reamed out and drilled 35 feet below the former bottom of the well, originally a Dundee gasser. It is now about 2,085 feet deep and drilling ahead.

The Muskegon Oil Corp.'s No. 1 Bouwsma, SW NW NE, Section 5-10n-16w, Muskegon Township, northeast of the proved field, is drilling at more than 1,000 feet deep.

Three other wells, including the Reed Oil Co.'s No. 1 A. Starre structure test, SE NW SW, Section 9-11n-17w, Fruitland Township, Muskegon County, the Lima Oil Corp.'s No. 9 Louis P. Haight, SW SW SW, Section 9-10n-16w, Muskegon Township, and the Middle-West Oil Co.'s No. 3 on the Mrs. Moch heirs lease, SE NE, Section 7-10n-16w, Muskegon Township, are just getting under way.

New Locations

Two new locations other than the Reed-Bullock structure test in Fruitland Township, Muskegon County, were announced during the week following receipt of permits from the state conservation department.

They are Wittmer Oil & Gas Properties' No. 1 McArthur, W half SE, Section 9-14n-6w, Broomfield Township, Isabella County, and Fred N. and Kathryn B. Potter's No. 2 Riverside Syndicate, SE SE SW, Section 20-30n-8e, Alpena Township, Alpena County.

A correction in the location of Henry M. Brown's No. 1 McKay-Mercier changed it to NE NE SE, Section 1-17n-5w, Surrey Township, Clare County.

Tubing has not yet been successfully set in the Michigan Petroleum Co.'s No. 1 C. E. Moe, SE SE, Section 6-9n-13w, Chester Township, Ottawa County, where a show of gas was struck two weeks ago below 6,000 feet.

Considerable trouble has been experienced in getting the long string of tubing to hold in the well long enough to bail out the water and test the flow of gas.

KANSAS FIELDS

(Continued from Page 44)

NW cor., Section 4-15-20w, is dry and abandoned at 3,832 feet.

Greenwood County

Simmons and others moved a machine in for No. 5 Harris, SW cor. SE NW, Section 19-22-11. York State Oil Co.'s No. 11 Westcott, CWL E half NW, Section 33-22-11, is spudding. Simmons and others' No. 4 Greenwood, NW cor. SE SW, Section 19-22-11, has been completed for 50 bbls. in sand 2,085-2,104 feet. Empire Oil & Refining Co.'s No. 2 Wasson, NE cor. SE, Section 22-22-12, made 25 bbls. in sand 1,699-1,708 feet. Aladdin Petroleum Co. and Phillips Petroleum Co.'s No. 1 Spain, NE cor. NW SE, Section 13-23-9, is dry and abandoned at 2,473 feet. O'Neil and others' No. 1 Ford, NE cor. NW, Section 28-25-13, has been abandoned at 1,575 feet. International Oil Co.'s No. 2 Lowery, SE cor., Section 21-26-9, made 50 bbls. in sand 2,246-69 feet.

Kingman County

Slick, Pryor & Lockhart's No. 1 Wetherall, NE cor. SW, Section 36-29-6w, has been abandoned at 4,535 feet.

Lyon County

Phillips Petroleum Co. and others made location for No. 1 Barr, SW cor. NW NW, Section 29-20-10.

Marion County

Maydwell and others' No. 1 LaMaster, NW cor., Section 31-22-4, is a rig.

Rawlins County

Danciger Oil & Refining Co. and others' rig is up for No. 1 Jones, SW cor., Section 3-2-35w.

McPherson County

Lario Oil Co. and Shell Petroleum Corp.'s No. 1 Miller, SE cor., Section 1-20-2w, is moving in. The Texas Company made location for No. 5 Munn, NE cor., Section 12-20-2w.

Reno County

E. L. Study and others' No. 1 Haury, NE cor. SW, Section 1-23-4w, has been completed for 23,000,000 feet of gas in sand 3,326-33 feet.

Sedgwick County

Douglas Avenue Oil Corp. has the rig up for No. 1 Bruner, SE cor. NE SW, Section 24-27-1, Eastborough Pool. National Refining Co. and others' No. 2 Murdock, SE cor., Section 18-27-2, is a rig under construction. Benson and others' No. 1 Carlton, SE cor. SW, Section 24-28-1, is an old well preparing to deepen from 1,680 feet. Aladdin Petroleum Co. and others' No. 1 Christman, SE cor. NE NE, Section 25-27-1, is dry and abandoned at 3,297 feet. Fisher & Lauck's No. 6 Trustee, NE cor. NW SE, Section 19-27-2, made 650 bbls. in chat 2,945-74 feet. E. F. Jones and others' No. 1 Rimel, SW cor. NW SW, Section 20-27-2, has been abandoned at 3,400 feet.

Seward County

Liberal Oil & Gas Co.'s No. 1 Boles, C N half NE, Section 4-35-34w, is drilling at 1,650 feet.

Stevens County

Argus Production Co.'s No. 1 Hoon, C NE, Section 30-32-37w, has been completed for 11,805,225 feet of gas in sand 2,605-2,717 feet. No. 1 Ellis, C NE, Section 12-33-38w, made 3,652,224 feet of gas from sand 2,571-2,715 feet. No. 2 Ratcliff, C NW, Section 8-33-37w, has been completed for 2,974,062 feet of gas in sand 2,587-2,798 feet. No. 1 Bunyan, C SW, Section 23-33-37w, gauged 3,718,656 feet of gas from sand 2,604-2,801 feet. No. 1 Forward Fee, C NE, Section 5-34-38w, has been completed for 5,726,361 feet of gas in sand 2,585-2,808 feet. No. 3 Ratcliff Fee, C NW, Section 7-34-38w, has been completed for 4,152,330 feet of gas in sand 2,603-2,818 feet. No. 1 E. Jester, C NW, Section 7-34-36w, made 5,320,000 feet of gas from sand 2,647-2,793 feet. No. 1 Moore, C SW, Section 18-35-38w, made 2,193,408 feet of gas from sand 2,638-2,798 feet.

Sumner County

Harris & Haun and others moved rig material in for No. 1 Duncan, C NE SW, Section 15-35-2.

TARIFF COMMISSION OPENS OIL INQUIRY

WASHINGTON, D. C., Oct. 13.—The United States Tariff Commission will open a hearing concerning the cost per barrel of petroleum delivered to refineries along the Atlantic Coast from the oil fields of this country and from Venezuela and Colombia, beginning October 31.

The commission is sending four or five investigators to the Mid-Continent, some of whom may be ordered to the California oil fields, to investigate this problem. No plans have been made up to this time to send anyone to South America to obtain testimony concerning prices at which oil is shipped from ports through which this oil passes.

It is now four months since the passage of the tariff bill which contained a provision for this investigation by the tariff commission with instructions to make a report to Congress at the end of eight months and the hearing announced for October 31 is the first action taken in compliance with congressional direction, this delay resulting from the changes the President has made in the personnel of the commission. A report will be made to Congress at the end of the eight months' period, even if it is only one reporting progress. It is not believed the information required by Congress can be obtained by that time, however.—C. E. K.

A.P.I. OFFICES MOVED

The Pacific Coast office of the American Petroleum Institute in San Francisco closed October 7 and all records were moved to the new Pacific Coast office at 530 West Sixth Street, Los Angeles, Calif.

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The OIL and GAS JOURNAL
Classified Wants Section

Chicago Demand Is Reported Small

Almost Entirely for U. S. Motor and Antiknock Fuels With Higher Gravities in Little Request. Prices Reflect Lack of Demand

By J. B. Waldo

CHICAGO, Oct. 13.—Although the weather has been exceptionally fine for October, the demand for gasoline does not indicate any large use of automobiles. The orders booked in this market this morning were light, some stating that the business was not so good as a week ago while others had a little better demand. All agree that the demand is small and some concerns will secure a little more of the going business one week while another takes the larger end the following period. The demand is almost entirely for the U. S. Motor and for antiknock fuels. The higher gravities are in little request, the only seller in any quantity being the 400 endpoint gasoline. The majors are continuing to quote their former prices for spot business but the open market continues to show the result of lack of demand with gasoline freely available, if not actually pushed for sale at slightly sagging prices. The top price in the open market here for motor gasoline today was 5½ cents Group 3 with 5⅜ and even 5¼ cents offered by some. One of the large marketing concerns was endeavoring to lighten the load of some refiner by offering 60-62 400 endpoint doctor and corrosion test, an in all ways excellent gasoline for 5¼ cents. For the higher gravities the usual price quoted was around 6 cents for any gravity. The only good feature in today's gasoline business was that practically every order was a rush order and in many instances the order was accompanied by the statement that the station was about out of gasoline.

Kerosene continues to drag along at former prices. The warm weather has curtailed the business in furnace oils, buying being light and some orders on contracts being held back as the dealer lacked room to take in any more material. The number of inquiries for heavy fue oils was limited, and here, too, the warm weather was a factor in the slowing down of the demand. The weather man foretells the continuance of the present summer like weather for several days and it may be that the week will show little change. If it does not, the result will be further accumulations of fuel oils.

The gasoline sales last week were practically all made during the forepart of the week. With some sellers, the first two days were marked by a good business and others had only a single day of active selling. But the volume of the business done on these days was sufficient to make a fair week. The gasoline demand is not active enough with the jobbers to make them buy in excess of their immediate needs. For some reason, motor cars are not being used to the same extent as they were in 1929 and previous years. Judging from reports made by fuel oil salesmen and sellers of lubricating oils to the industries, the country manufacturing plants are less active than those in the larger cities. There is a rather prominent little city near Chicago which has grown up around a single industrial plant. That plant has been working with a reduced force for three days a week and the management is holding on hoping that the fall demand will be sufficient to permit operations, on the present scale at least, for the winter. If the demand does not come it will be forced to close down as it has accumulated a supply of its product which is just about filling storage to capacity.

There is another city in this State which has three well-known manufacturing industries, all of which have been closed down since the early spring. The management has no prospects of immediate resumption of business. There are families in both these cities which are finding it hard to secure the actual necessities and they are not running their cars. The situation is much the same all over the Middle West. Even if the head of the family has a job today, he does not know how long it will last. There is another point that has its effect on purchase and that is that in many plants which are working, the full wages are not being paid so that the income of the townspeople is reduced. There are some of the larger oil companies which claim that their gasoline sales have shown a steady increase over last year all through 1930, but they have added to the number of their stations both by building, by purchase and by leasing the station. There are very few jobbers who are operating the same number of stations who will claim that they are doing as much business as they did in 1929, at this time.

Prevalence of Cut Prices

Another reason for the falling off of jobbers' sales is the prevalence of cut prices. The general public is looking for low prices. Indeed one economist believes that a good part of the present business depression is due to the resentment of the public against high prices and states that they have adopted the surest way to secure lower prices by not buying anything more than they have to have. The recent "lows" in such articles of daily consumption as butter, eggs, sugar, flour and the like bears out the theory at least to the extent that the general public is curtailing its purchases or is buying more directly at lower prices. The trackage station, according to the figures of an oil man who has made a study of them, is doing business on an overhead of between 1 and 2 per cent. They sell, that is the real trackage stations, sell, according to the oil man, from 12 to 25 cars a month the year 'round. One such station in Chicago sold 60 cars one month this year and its minimum is 20 cars during any one month in 1930. It is not the largest trackage station in the city. There are in Chicago not to exceed six such stations, according to this salesman, but at least two of these have a location secured for another similar station, so that by next spring there will be at least eight stations unless something happens to put a stop to them. Apparently nothing in the ordinary way of the industry such as a severe price cut will really harm them so long as their overhead expenses are kept at the low figure stated. The owner of the plant which sold 150,000 gallons a month so far this year states that he has an overhead of 1 cent and if he makes a profit of 1 cent a gallon he is satisfied. His last lot of gasoline cost him 5.5 cents, Group 3. Adding to this 2.38 cents for the freight, 3 cents for taxes and 2 cents for overhead, we have a total cost of 12.38 cents. He is selling at 2 cents under the station price, or 15 cents, which leaves him a profit of 2.62 cents. We understand that this particular station has an exceptionally good ground lease. Another station, which is doing almost as much business, paid $75,000 for the ground on which the station is built.

Offers a Solution

It may be that the trackage station offers a solution of the present overbuilding of small service stations. Oil men familiar with eastern cities say that the stations are not crowded together to nearly the same extent as they are in Chicago and other western cities. It makes little difference to the motorist if the stations are 2 or 10 city squares apart. The stations are built seemingly on the idea that a motorist carries a can to the station and takes the gasoline home to the car. Not on the idea that the car is driven to the station and that any station along the line of travel for that car is a convenient station at which to get a fill. The trackage station has a large number of pumps. There is one station with nine and another with 12 and some have even more and they do the business of at least 20 average stations with less investment, less help and less managerial expenses. The plan of consolidating several stations will come about with the falling off in the excessive competition which is the industry's curse today. In any growing city the land will be worth more than the amount that was paid for it and the owners will suffer no investment loss from the change. Some of the local refiners find that with a large truck and a trailer, they can deliver gasoline in quantities at as low a rate as the short haul fare rate charged by the railroads. With a good-sized truck and trailer, the refiner can save money on his short hauls and can deliver to a large station at little greater cost than the trackage station with its railroad connection pays for its gasoline.

Gasoline Market

The open market for gasoline was not only dull but it was easy last week. With a light demand and considerable pressure to sell, prices worked downward a trifle. The majors were still holding their 6½-cent price and for very good reasons but the open market was dominated by the Tulsa brokers and the North Texas refiners and prices were named freely of 5½ cents to jobbers and at the close of the week good gasoline, but not of Oklahoma origin, was offered to marketers at a resale price of 5⅛ cents. None believed that a good order at 5 cents the Group for U. S. Motor gasoline would have been rejected. Here are the prices which a large jobber in this State gave to the writer as the prices quoted him for gasoline. Straight U. S. Motor at 5¼ cents; 60-62, 437 at 5¼ cents; 60-62, 400 at 5½ cents; 64-66, 390 at 5¾ cents. He said that the prices for 64-66 375, and for 68-70 360, were on the sale level and that he bought the latter at 6 cents. Asked if the amount of his purchases was so large as to give him a price below the market, he said that he had only bought a couple of cars for his present needs. This jobber is a very large distributor and a shrewd buyer and no salesman who wanted to sell him would quote any but his lowest price. Smaller buyers might have to pay as much as 5½ cents for Motor gasoline and considerable gasoline was sold last week at that price. Some sales were made at higher prices early in the week, a limited quantity being sold at 5¾ cents. The feeling here is that gasoline is bound to be cheap this fall and winter and there are many who talk of 5-cent gasoline, as some say, "with or without a crude cut." Perhaps a cut in crude might not make such a difference, as some Texas refiners are buying a part, if not all, the crude they run at less than the posted prices.

Pennsylvania Gasoline

The situation in the differential territory to the east of this city is still bad, but some spots have been cleared up and prices are once more normal. In Detroit, the expectations have been that some sort of a settlement would be reached and in fact it was reported that the independent operators had posted a price of six gallons for $1 and the majors would name the same price this morning. The present price is seven gallons for $1, or 14.38 cents, with a 3-cent tax. Gasoline out of Pennsylvania is being bought by Detroit jobbers at 8¾ cents, delivered, which with the tax makes the cost of the gasoline 11⅝ cents and gives them practically 3 cents to apply on their expenses. The trade does not like to see Pennsylvania gasoline coming this far west but the eastern refiners have to compete with California gasoline and with South American gasoline, as well as with gasoline refined in the United States from Venezuelan or Colombian crude and may require larger markets. Gasoline will soon be run by pipe line from the Atlantic Coast refineries to Pittsburgh and it may be that it will be possible to ship this motor fuel as far west as a point where it will meet the gasoline which will be shipped from Oklahoma by pipe line to Chicago. This Great Lakes pipe line will not be operating before next spring, but from the way that some of the companies who are interested in it are increasing their Michigan and Indiana distribution it looks as if they expected to be able to compete with any refineries anywhere in this territory. The coming spring may see some new competition in the gasoline market when the pipe line gasoline is offered to the trade.

The higher gravities are still overshadowed by Ethyl Gasoline. One large integrated company which will take on Ethyl Gasoline will make its announcement at the close of this month in the case of some publications but not until the first of November will it begin the sale of its Ethyl Gasoline. Men in charge of the management in discussing the company's own make of antiknock gasoline say they believe that their brand is really a better motor fuel, but that they cannot make the public understand that this is so, and they will give the public what it wants, at least in the northern part of its territory. Natural gasoline has been of slow sale and prices have been let down a little.

Kerosene

Kerosene is moving slowly but in a steady sort of way, although the business is not large. Several refiners have stated that they had thrown their kerosene into their distillate and had no kerosene to offer. The prices range from 3¼ to 3½ cents with some doubt as to the price at which a good order could be placed.

Furnace Oils

Furnace oils have been doing pretty well, although the demand has been limited by the mild weather. One thing that has been noticed lately is that good buyers insist on a low endpoint. The reasons given for this is, according to several in the trade, that a distillate with an endpoint of 600° or over will coke up the burners much more quickly than one with a lower endpoint, and also in those designs of furnaces in which the flame is produced around the edge of a plate or some form of burner which throws the blaze against the sides of the firebox, the flames will not burn clean but drops a lot of soot. Many of the jobbers have demanded that their distillates and similar furnace oils have an endpoint of 550°. It would be well in sending specifications to dealers who are buying for resale, and to jobbers as well, in making a direct quotation, to be sure and give the endpoint. Only a day or so ago a large order was held up at the last moment by the lack of information as to the endpoint of the material. The oil was an ideal distillate in all other respects and the price was right for such an oil, but the buyer, a large downstate jobber, insisted on having the endpoint and everything had to wait. It was formerly assumed that the endpoint went with the other specifications and that a refined oil with a low flash had a low endpoint, but this idea

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Better Conditions on the East Coast

Tendency Is to Correct Evils That Have Prevailed in Gasoline Market. Restricted Operations Are a Help

By A. E. Mockler

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NEW YORK, Oct. 13.—Indications of a definite policy of correcting evils which have prevailed in the gasoline market over the greater part of the year, are seen in the refinery gasoline markets in the East Coast area. Notwithstanding the fact that the season of peak consumption is over, and competition for business is naturally keener, refiners are getting away from the price cutting angle, and there is perhaps a closer conformity to the posted price basis in eastern markets now than for six months past. While this may seem like locking the stable door after the horse has been stolen, it is nevertheless a definite sign of a turn for the better in the competition situation, and this, along with the continued drop in refinery operations and surplus gasoline stocks, has made for a better feeling in the general market.

Oil companies in general in this territory are expected to make an exceedingly poor showing for the full year 1930, from an earnings standpoint, but it is thought that if the present trend in refining and marketing continues for the balance of the year a sound ground work will have been laid for a profitable 1931.

General business in refined products has held up fairly well during the past week, and with the exception of further declines on a few grades of lubricating oils and paraffin wax, the market was without change, from a price standpoint.

General satisfaction is expressed at the continued heavy withdrawals of gasoline from storage, and this, in conjunction with the restricted operations at refineries, is bringing about a decidedly improved feeling among refiners. With the results of the A.P.I.'s investigation into the question of adequate working stocks required for the operation of the industry now before them, refiners for the first time are in position to definitely gauge their refinery runs and have a definite mark at which to aim in bringing their surplus gasoline stocks into line with actual requirements.

Tank Car Gasoline

An improvement in sentiment is noted in the local refinery market this week, and there is more or less of a general disposition to bring the market for U. S. Motor gasoline into line with the posted price of 7¾ cents per gallon in tank car lots at refinery terminals. Sellers who have been out for the gallonage regardless of price have found business taken on this basis so unprofitable that they are again falling in line with the general market.

While it is still possible to shade the posted price by a quarter to a half cent per gallon, sellers at these levels are by no means as numerous as was the case toward the close of September.

Gasoline stocks held at refineries are steadily dwindling, and while there is still plenty of gasoline to go around, and to spare, it is evident that the market is working into stronger ground and it appears certain that refiners are now turning out gasoline to sell at a profit, rather than at a price.

Refiners are paying considerable attention to gasoline quality, and sales of premium grades are steadily growing, with U. S. Motor being relegated more and more to the background in favor of the higher test motor fuels. Eastern refiners in several instances expect to sell more premium gasoline than ordinary U. S. Motor fuel during the coming winter months, and it is believed that the trend toward the higher quality product will continue unchecked.

There has been considerable activity reported in the market for gasoline in barge lots, and business was reported closed during the week at 7 to 7¼ cents per gallon for U. S. Motor, at refineries, in lots of from 2,000 to 20,000 bbls.

A cargo of Gulf U. S. Motor was reported to have been booked during the week at 6⅞ cents per gallon, laid down at New York.

Tank Wagon Gasoline

Continued price cutting is reported in retail markets, and prominent brands are being freely sold in the metropolitan area at 7 gallons for $1, including State tax. With discounts which are available to motorists in some instances, this price can be shaded further by about a cent per gallon.

Premium motor fuels are also coming in for price shading, and the growing gallonage of the higher priced gasoline is being accompanied by growing competition in retail marketing.

Large integrated companies with service station chains are expected to take the leadership soon in a move to restore the market in this area to posted levels. This will probably require a revision in posted prices here, but it is expected that when, and if, this revision materializes, a definite effort will be made to maintain prices.

The better feeling in the refinery markets, it is expected, will materially aid in a campaign to restore some degree of stability to tank wagon and service station prices, and with a noticeable lessening of price cutting in the jobbing market, this improvement will probably be reflected shortly in the retail end of the business.

Gallonage is holding up fairly well in most sections of the East, although cold weather has caused some falling off in motoring, and a further drop is naturally looked for during the remainder of the year.

Kerosene

Spot buying of 41-43 gravity water white picked up this week and the refinery market is fairly active at 6¾ cents per gallon in tank car lots. There is very little shading of the posted price, and refiners look for a gradual steadying of the market at the current level during the next several weeks.

Colder weather has stimulated consumption throughout the area, and the tank wagon end of the business is picking up right along. Competition in kerosene sales is by no means as pronounced as is the case with motor fuel, and refiners are not having much difficulty in maintaining posted price levels for burning oil.

As a result of the unfavorable economic situation now prevailing in many sections of the East, particularly in manufacturing areas, marketers believe that kerosene heaters will be more generally used for domestic heating this year than for many years back, and look for a resultant increase in consumption over the winter months. Consumers will probably revert to this relatively cheaper form of heating in preference to the more expensive heating by coal or electric heaters, it is believed.

Diesel Oil

Consumption of Diesel oil is improving steadily, and refiners expect that the close of the year will show a substantial increase in gallonage over previous years. Marine use of Diesel oil is widening right along, and domestic consumption is likewise on the upturn.

The market for 28-30 Diesel remains steady at $2 per barrel, in bulk, at refinery terminals, the market for this oil having not yet become affected by recent weakness in bunker "C." In as much as the latter was advanced 10 cents per barrel some months ago without a corresponding mark-up in Diesel oil prices, it is not expected that any lowering of quotations for the latter oil is called for at this time.

Fuel Oil

The market for bunker "C" fuel oil remained unchanged at the recently reduced price of $1.05 per barrel, in bulk, at refinery terminal, with the usual additional charge of 5 cents per barrel for barging alongside within the harbor limits. An active demand is reported from the big steamship companies. A number of large vessels normally in the transatlantic run have been placed in the winter cruise service out of New York, and this has resulted in a larger movement of bunker oil, vessels which normally take on half of their bunkering requirements at European ports now doing all of their fueling here.

Industrial volume in bunker oil is holding up well, but eastern refiners are meeting with growing competition from the Pacific Coast. One of the large independent California companies has during recent months shipped several hundred thousand barrels of fuel oil to the Atlantic Coast for delivery against contracts with public utility companies in this territory.

Gas Oil

There is a better inquiry reported in the spot market, and the undertone has firmed up a little. The posted price remains held at 5¼ cents per gallon for 28 gravity plus gas oil, and while a little oil is reported available at an inside price of 4¾ cents at refinery terminals, the general market now appears closer to the 5 cents level. The demand for gas oil from gas manufacturing companies has increased appreciably during the past week.

Lower grades of gas oil are still meeting with an active call for deliveries against domestic furnace oil contracts, and refiners expect to make substantial inroads into their storage holdings of these oils during the winter season. Jobbers have been taking this oil in tank car lots in substantial volume, it is reported.

Paraffin Wax

Continued quiet demand and absence of new business has made for further easiness in the position of the wax market this week, and prices were lower on several grades of fully refined. The market for 120-122 a.m.p. was quoted at 3 cents, with 125-127 a.m.p. at 3¼ cents, and 130-132 a.m.p. at 3⅝ cents, declines of one-eighth cent a pound in each instance.

A sale of 122-124 a.m.p. white crude scale was reported made during the week at 2.05 cents per pound, seaboard, the lowest price recorded on this grade for some time.

Domestic consuming manufacturers with term contracts were not ordering forward shipments in much volume, and there was a general disposition being shown to let refiners carry the load as long as possible. Holdings of both crude scale and fully refined are still burdensome in some quarters, and selling pressure develops frequently. Some interest was shown during the week by export buyers, and it was believed that shipments to the Far East would show a substantial improvement shortly.

Furnace Oil

There was an active market for both light and heavy grades this week, and a firm tone prevailed, both in refinery and tank wagon markets. Oil burner manufacturers are quoting record low prices on new installations and consumption is steadily widening.

It is rumored in financial circles here that one of the large mail order houses is planning to place a low priced oil burner on the market next year, or in 1932.

Refinery stocks of furnace oils are fairly large, but with considerable business on oil for domestic heating purposes already booked at fixed prices, refiners anticipate a fairly steady market on these oils over the winter season.

Lubs

Considerable irregularity characterizes the lubricating oil market, and prices quoted are conflicting on a number of grades. While it appears generally conceded that current quotations on many specifications of cylinder oils are under replacement costs, it is obviously a case of liquidation with some refiners, and the market is by no means stable at the low price basis now prevailing. The market for 600 Pennsylvania flash has sold off 2 cents per gallon at 26 cents, with 630 flash showing a corresponding decline to 29 cents per gallon. Bright stocks are still in rather easy position, although no further price changes materialized during the week.

Refiners report a slowing down in the demand for pale and red paraffin oils, but prices have not been revised downward. Consuming manufacturers are ordering forward shipments on contract only as required, and show no inclination to add to their inventories or take in any oil ahead of actual requirements.

More export interest in cylinder oils is discernible, and it appears probable that considerable quantities of distressed stocks of these oils will be moved into consumption through export outlets.

Petrolatum

Seasonal expansion in domestic consumption of petrolatum has set in, and refiners specializing in this product report a broader demand for both prompt shipment stocks and material for delivery over the balance of the year.

Lily white is quoted one-eighth cent per pound higher at 6¾ cents, the market holding quotably unchanged on the other grades. Dark green is moving into export channels in fair quantities at 1¾ cents per pound, with sellers in some instances unwilling to book business on this grade under 1⅞ cents per pound in barrels.

Reports from the pharmaceutical manufacturing trade indicate continued expansion in the consumption of petrolatum in various preparations.

Gulf Export Market

A cargo of approximately 7,500 tons of California 375 endpoint gasoline was reported closed during the past week for November shipment to Hamburg. While the price was not mentioned, it is believed that the cargo was taken at association prices, with the usual differential for California shipment.

An inquiry for a cargo of 6,000 tons of 64-66 naphtha for November shipment from the Gulf to France is pending, but up to the time of writing this inquiry had not been formally made. There were no actual cargo inquiries for either gasoline or kerosene reported at the Gulf this week.

Considerable quantities of gasoline are reported moving into export channels from Aruba, Dutch West Indies, and it is probable that a number of cargoes for high test motor fuels which would otherwise have come to the Gulf are being taken care of at the Dutch West Indies refining center.

While the export association is expected to make a downward revision in its posted price schedules for gasoline and kerosene at the Gulf, nothing definite has developed in that direction as yet. It is expected that the association at an early meeting will make a number of important changes in its method of operations

designed to make for a more stable export market.

Petroleum Exports

Lower prices for refined products have brought out a better demand in the local market, and there was a fairly large increase in shipments of principal products into export channels through the local port during the week ended October 4. There were more inquiries coming in, and it was expected that considerable prompt shipment buying would be done, although export buyers are not expected to operate far in advance of actual requirements under present conditions.

The following table shows principal exports of refined petroleum products from New York for the past three weeks (all figures in gallons unless otherwise noted):

	Week ended		
	Oct. 4	Sept. 27	Sept. 20
Gasoline	625,000	385,000	285,000
Naphtha	475,000	650,000	475,000
Kerosene	150,000	420,000	250,000
Fuel oil	195,000	130,000	175,000
Lubricating oil	3,165,000	1,350,000	1,860,000
Petroleum, refined	2,590,000	1,700,000	1,325,000
	Pounds		
Petrolatum		35,000	
Paraffin wax	2,220,000	1,355,000	3,025,000
Refined		390,000	
Scale	1,125,000	200,000	1,248,000
Lubricating grease	1,125,000	850,000	900,000

There were several fairly large cargoes shipped out of the local port during the week. The General Gassouin cleared for French ports carrying a cargo in excess of 1,125,000 gallons of cylinder and other lubricating oils. The Benedict cleared for South American ports with a cargo including more than 600,000 gallons of refined products, and the steamer Tai Ping Yang cleared for Takow with 400,000 gallons of refined petroleum in her cargo. The City of Cardiff, clearing for Rangoon, carried more than 500,000 gallons of refined products in her cargo. The Sandgate Castle cleared for South African ports with a cargo of several hundred thousand gallons of refined products in her cargo.

Imports

Imports of crude and refined petroleum at the principal ports during the week ended October 4 totaled 1,164,000 bbls., a daily average of 166,286 bbls., compared with 2,533,000 bbls., a daily average of 319,571 bbls. for the week ended September 27. Details follow:

(Barrels of 42 gallons)

At Atlantic Coast Ports—	
Baltimore	311,000
Boston	27,000
New York	557,000
Philadelphia	269,000
Total	1,164,000
Daily average	166,286
At Gulf Coast Ports—	
All ports	None
At Atlantic and Gulf Coast Ports—	
Total	1,164,000
Daily average	166,286

Distribution of total imports is as follows:

Crude	514,000
Gasoline	389,000
Fuel oil	261,000

California Oil Receipts

Receipts of California crude and refined petroleum at Atlantic and Gulf Coast ports for the week ended October 4 totaled 282,000 bbls., a daily average of 40,286 bbls., compared with 615,000 bbls., a daily average of 87,857 bbls. for the previous week. Details follow:

(Barrels of 42 gallons)

At Atlantic Coast Ports—	
New York	207,000
Others	75,000
Total	282,000
Daily average	40,286
At Gulf Coast Ports—	
All ports	None
At Atlantic and Gulf Coast Ports—	
Total	282,000
Daily average	40,286

Distribution of total California oil receipts is as follows:

Gasoline	207,000
Fuel oil	75,000

Shipments of California refined petroleum products for the Atlantic and Gulf Coast markets during the week (with identity of owner of tanker moving the oil where such owner of record is an oil company) were as follows:

To New York—111,600 bbls. of gasoline on the Tidewater (Tide Water Associated Oil Co.); and 77,800 bbls. of gasoline on the Meton.

To Miami and New York—80,000 bbls. of gasoline on the Huguenot (Richfield Oil Co. of California).

To Philadelphia—113,300 bbls. of gasoline on the Chester Sun (Sun Oil Co.).

To Miami—77,000 bbls. of gasoline on the Atlantic Sun (Sun Oil Co.).

To Portland, Me.—97,200 bbls. of gasoline on the Standard Arrow (Standard Transportation Co.-Standard Oil Co. of New York); 65,000 bbls. of fuel oil and 7,000 bbls. of gasoline on the Lebec (Standard Transportation Co.-Standard Oil Co. of New York); and 69,500 bbls. of fuel oil on the Deroche (Union Oil Co. of California).

DEMAND IN CHICAGO IS REPORTED SMALL

(Continued from Page 126)

has been proven wrong since the days of new crudes and varied processes. Furnace oil demand is a waiting one, waiting for the real cold weather to come to this territory. Until it does, the consumption will be moderate to light and as the dealers are not selling more oil than a man really needs and will pay for at once, the business is still light compared with what it will be with colder weather.

Gas Oils

The demand for light colored gas oils, straw preferred, but a light amber will do with a good many jobbers, is active and there is much seeking for a good straw gas oil which will answer the requirements for furnace use. There is some gas oil available which has all the requirements of a good oil except that the odor is not sweet. Dealers are already having trouble with rejections of cars on account of odor and from present appearances the first part of the furnace oil season will be one of critical examination of all shipments. Gas oil prices are very firmly held and are a little higher. Distillate is also working upward slowly and a first-class prime white distillate is still an eighth of a cent higher than the straw gas oil. The light fuel oils are also very firm and a cold spell would in all probability develop into an advancing market for the gravities above 26-30, zero, domestic fuel oil.

Heavy industrial fuel oils are moving but not actively. There are still too many plants closed down, or working part time, to permit of heavy buying. Good zero fuel oil is rather hard to buy right now in this market and some refiners have advanced their prices while others have withdrawn from the market entirely. One local plant has increased the price of its 18-22 fuel oil to the consumer to 55 cents. Another local refinery is out of the market for fuel oil and the Shell company is still sold ahead on contracts. Many of the oil trade believe that the Shell is out of the market partly as a means of getting the market up to its contract rates but the Shell management state that they are honestly sold up and more than sold up and that if their contract dealers take all the material that is coming to them and their own distribution is anything like what it was last year, they will barely have enough to get through the season. Much depends on the extent of the demand and that is helped or hindered by the weather. A good low sulphur zero 18-22 fuel oil is selling today at more than 50 cents a barrel in this city. The prices are somewhat uncertain owing to the fact that orders are limited and that for each order there are a dozen sellers at least who are after the business and quote low prices to get it. The situation is a good deal like the large building firm which figured actual costs on a very large bit of construction work, explaining that they did it to hold the organization together. Many of the bids are made not so much to make money as to give them something to work on.

Refinery Stocks

The market for the refinery stock is not an active one but something is doing all the time and salesmen find sufficient encouragement in the situation to get out after business. The situation is so uncertain that prices are affected by the conditions, and, while the quotations are freely circulated, the prices actually paid are not as freely given out. The demand for compounded motor oils is rather light and industrial lubricants are slow sellers with most compounders.

Tank Wagon Prices

There is little new in the tank wagon prices. There are the usual requests for advance information as to when the next change will be made and on this subject nothing definite is available. It is understandable how the major refiners might make a cut but it is hardly possible that there will be any further adjustments of the tank wagon scale in a general way unless there is a reduction in the price of Mid-Continent crude. Minor adjustments are being made daily and some of these changes to normal prices are at rather important centers of distribution. The hope is frequently expressed that within a short time there will be only a limited number of points at which the price will be below normal.

LA.-ARK. FIELDS

(Continued from Page 50)

borne Parish, another well that has been carried on the report for several months during which no change in its status has been made also is dropped from the list; dry and abandoned at 2,240 feet.

Joe Burnham's No. 1 Hood, Section 3-11-14, Spider district of DeSoto Parish, southwest of Mansfield, has been abandoned as a salt water hole at 2,762 feet but at the same time Arkansas-Louisiana Pipe Line Co., having drilled one failure and one small gasser on the Johnson land in Section 1-11-14, has derrick up for No. 3 on the same lease. The week was rather prolific in the way of dropping from the report wells that had been carried for weeks and months without any change being made, and among them was S. D. McDaniels and others' No. 1 Clark and Morse, a wildcat in a particularly wild and inaccessible corner of Natchitoches Parish. A cause of grief to every scout who had to check it, none of them is shedding tears because it has been abandoned; a salt water hole at 2,536 feet.

Monroe—Richland

At 2,985 feet Pelican Natural Gas Co. is still in igneous rock topped at around 2,890 feet on No. 1 Tensas, Section 17-18-6, a wildcat between Monroe and Richland gas, and apparently there is not much hope for it. No more than there is for Island Gas Co.'s No. 1 Noe in Section 3-16-5, Richland Parish, 3 miles from nearest production. After two dry tests at 2,419 feet and 2,460 feet, this prospect had salt water on three tests, at 2,379 feet, 2,509 feet and 2,539 feet, and was shut down in gumbo at 2,549 feet, approximately 100 feet below the standard Richland producing horizon of 2,450 feet. Greenwood Production Co. completed No. 1 Burrell, Section 21-20-4, Morehouse Parish, making 23,140,000 feet of gas at 600 pounds rock from 2,135 feet; Louisiana Gas & Fuel Co.'s No. 26 Crossett, Section 33-21-5, plugged back after a dry test in the second horizon at 2,380 feet, to 2,243 feet in the original Monroe pay, tested 2,880,000 feet of gas at 665 pounds. Southern Carbon Co.'s No. 13 Tensas, Section 4-20-4, gauged 8,737,000 feet of gas at 920 pounds from 2,152 feet. Other completions in the Monroe district were Amalgamated Co.'s No. 1-B Kate Cole, Section 25-20-4, Ouachita Parish, making 6,000,000 feet of gas from 2,172 feet, and Bahan & Bahan's No. 1 Tanner, Section 29-22-4, a semiwildcat on the north, making 5,000,000 feet of gas from 2,177 feet. Down in the opposite corner of Monroe territory, Section 9-17-3, Ouachita County, C. W. Frierson ran testing tool on No. 1 Haynes at 2,462 feet but failed to get a good test and is setting 6-inch on top of Monroe gas rock at 2,433 feet. Location is about 10 miles southwest of nearest gas.

A semiwildcat in Richland, Palmer Corp.'s No. 11 Rhymes-England, in Section 12-16-5, on the northwest edge of production, tested 36,828,000 feet of gas at 810 pounds from 2,450 feet. Half a mile south of the nearest producer, there are two whole sections between it and developed territory to the east that has not had a drill in it. That is a sample of how much territory Richland gas field has yet to be tried out. Similar cases are scattered all through the more than 40 square miles of the proven field. Southern Carbon Co.'s No. 1-B Hallock in Section 1-16-6, gauged 51,192,000 feet at 1,015 pounds from 2,450 feet. Palmer Corp.'s No. 2 Rhymes-Earle, Section 36-17-5, another edge well marking a slight extension in the northwest corner of the proven area, gauged 29,304,000 feet of gas at 960 pounds from 2,450 feet.

MISSISSIPPI

Southern Petroleum Co.'s No. 1 Investment, NW SE, Section 12-5-1e, Rankin County, Mississippi, while not stretching proven territory any, was one of the best wells in the Jackson district to date. Prior to, and early in the development of this gas field, the idea was that the city of Jackson is located right square on top of the structure and that bigger wells would be found the closer they were drilled to town. Experience has shown the opposite, for the largest wells have been completed across Pearl River which borders the city on the east, and there are those who are still confident—largely on the strength of Gulf Refining Co.'s No. 1 Rainey, in Section 13-5-1e—that somebody is going to get an oil well.

ARKANSAS

Arkansas was almost out of the picture. Marine Oil Co.'s No. 1-F Wina, Section 10-18-13, Urbana district of Union Parish, which has been standing full of fluid half oil and half water from 3,604 feet and waiting for an air jammer for the past week or 10 days, had not started producing when this was written and consequently just what sort of well it is is not known. In Ouachita County, Belmont and others' No. 1 Buck, Section 16-15-17, 4 miles northwest of Mount Holly's abortive pool, cored sand showing oil at 2,726-30 feet and was to run testing tool. At this depth, assuming surface elevations to be approximately the same, this sand is about 200 feet higher than Mount Holly's pay streak. A wildcat—wildest of the wild—in Ouachita County, Graves Brothers' No. 1 Walker in Section 9-14-18, 10 miles southwest of Camden, tested at 1,845-61 feet, got one joint of mud with quite some oil in it, and cemented 5⅝-inch at 1,845 feet.

Developments in Miller County's prospective oil field, a few miles northwest of Garland City, did not show anything definitely one way or the other except that Salzer & McRae made location in the SW cor. NE NW, Section 9-16-25, for No. 1 Rose, 6 or 7 miles southwest of the discovery well. Most of the new locations and lease activity have been in the opposite direction. E. & F. Oil Co.'s No. 1 Beck, Section 36-15-26, 2 miles south of the discovery well, cemented 6⅝-inch at 2,799 feet, total depth (corrected) 2,807 feet, checking a little higher than the discovery. Cosden Oil Co. abandoned No. 1 Missouri Pacific Railroad in Section 13-9-19, Pope County, Clarksville gas district, at 4,909 feet as a dry hole. In Sebastian County, Lavaca Oil & Gas Co.'s No. 1 Moore, Section 27-8-30, Fort Smith gas district, made 3,000,000 feet of gas at 250 pounds from 1,558 feet.

There is a great deal of leasing activity in western Harrison County, Texas. Information from Marshall, the county seat, is that more than 100 leases have been recorded there in the past three or four days covering many thousand acres. Arkansas Natural Gas Corp., Vacuum Oil Co., Pure Oil Co., Humble Oil & Refining Co., Empire Gas & Fuel Co. and several other majors and a whole host of lease traders apparently have been busy in that part of the country for some time. There also has been some activity in Bowie County, just west of Texarkana. One lease, covering a block of 4,000 acres, calls for a well to be begun in 60 days or about December 15. G. R. Ridgeway and others' No. 1 Parker in the Jesse McKelvey Survey of Shelby County is reported to have made quite a show of gas from around 600 feet but details are lacking.

Manufacture of Natural Gasoline

Oberfell Outlines Economic Factors In Stabilization

In the open discussion of absorption and stabilization, following the reading of a paper on that subject by L. S. Gregory of Black, Sivalls & Bryson, Inc., at the national petroleum meeting of the A.S.T.M. in Tulsa during the past week, G. G. Oberfell, director of research for the Phillips Petroleum Corp., presented the economic side of the question in an unusual and convincing manner. He said:

"I do not feel that I can add anything to the excellent way in which he has presented the principles of absorption and rectification as applied to the natural gasoline and refining industries. I do believe, though, that the real economic value of natural gasoline has been often misinterpreted and is yet frequently misunderstood by the oil industry. Mr. Gregory says that the refiner and natural gasoline manufacturer look at the problem of absorption and rectification from a different economic value. Generally speaking, I would say that this statement is true, but this is not a condemnation of the economic law of supply and demand. It is more of an indictment of lack of knowledge, disagreements and misunderstandings regarding the properties of natural gasoline and the economics of its manufacture and distribution and utilization. Mr. Gregory has stated that the Natural Gasoline Association is considering new specifications for natural gasoline which, if adopted, will materially increase the demand for rectification. It is not my desire to appear to be humorous, but I believe that rectification has been more responsible for increasing the demand for specifications than will be the case of specifications increasing the demand for rectification. By this I mean that some of the less valuable, well rectified products have successfully competed with the more valuable unstabilized products. From an economic viewpoint regarding their true value, this is nothing short of a ridiculous situation.

"We have all heard much about the effects of propane upon gasoline and the necessity for removing it. The motoring public is consuming about 200,000 gallons per day of propane in the 25,000,000 automobiles in use throughout the United States. The main consideration for removal of this propane is the economic balance between the cost of its removal and the increased revenue due to the increased yield of natural gasoline made possible by substituting butane for the propane. The removal of propane can also be economically justified by an increase in net income, due to the increased market value of a better product. These two are the main considerations for rectifying natural gasoline.

"The same statements apply to the removal of isobutane, although in the latter case I believe there has been more time and money spent in propaganda pertaining to the necessity for removing isobutane than has been spent in its actual removal from natural gasoline. In my opinion the greatest forward step that has been made in the direction of the formulation of specifications for gasoline has been the adoption of vapor pressure regulations for the shipment of the product. The Reid vapor pressure testing method, while not ideal, is a practical approach to a true vapor pressure. As soon as the method has been in use for a sufficient length of time, the dark clouds of doubt and misunderstanding, which have obscured the path of progress toward better specifications for natural gasoline, will have been dissipated. As far as I can see, the end of the path was in view upon the adoption of the Reid vapor

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START CONSTRUCTION OF KETTLEMAN HILLS PLANT

LOS ANGELES, Calif., Oct. 11.—Standard Oil Co. of California, through its subsidiary, Standard Gasoline Co., has started work on a third gasoline absorption plant in Kettleman Hills. The new plant is to be of similar capacity to the others, that is, capable of handling 100,000,000 feet of gas in a day. The estimated cost is in the neighborhood of $450,000. The plant will be located in Section 33-21-17. With the completion of this plant, Standard will have three plants with a total daily capacity of more than 300,000,000 cubic feet of gas capable of producing 300,000 gallons of casinghead gasoline per day.

The erection of the third plant brings the total number at Kettleman Hills up to six, the others being operated by The Texas Company, Associated and Petroleum Securities. The Superior Oil Co. is also building a new plant which will have a daily capacity of 100,000,000 cubic feet of gas and will cost in the neighborhood of $450,000. Wet gas production of the field at present is approximately 565,000,000 feet daily, of which approximately 200,000,000 feet is being utilized after casinghead gasoline has been extracted.

SALES OF "BOTTLED GAS" SHOW STEADY INCREASE

Increase in the sale of liquefied petroleum gases, commonly known as "bottled gas," from some 223,000 gallons in 1922 approximately to 10,000,000 gallons in 1929, is regarded as indicative of the rapid growth of this new field.

Possibly their widest use is as a domestic fuel in territories not served by gas mains. Delivered regularly in steel cylinders quickly connected to household appliances, they enable the farm housewife to use a gas range for her cooking quite like that of her city sister. The number of customers thus served has grown from around 20,000 in 1928 to 55,000 in 1929, according to reports of the United States Bureau of Mines. Most of them live in the Northwest and north central states, in California and along the southern Atlantic Seaboard.

Liquefied gases also serve industry. Artificial gas manufacturers employ them as a base material and to increase calorific standards of their own product, to meet peak load conditions, as a protection against interruptions in service and as a source of supply for small communities. They are used also in heat-treating, hardening, annealing, enameling and similar operations.

VERIFY RESIDUE GAS CURVES

After analyzing considerable data collected over a year's time for the purpose of testing the accuracy of the residue gas curves in general use by gasoline manufacturers and producers since their adoption in April, 1925, the Natural Gasoline Association of America has found no reason to alter them. The purpose of these curves is to show the volume relation between the wet gas going to the gasoline plant and the volume to be returned to the producer lease, depending upon the gasoline content of the wet gas.

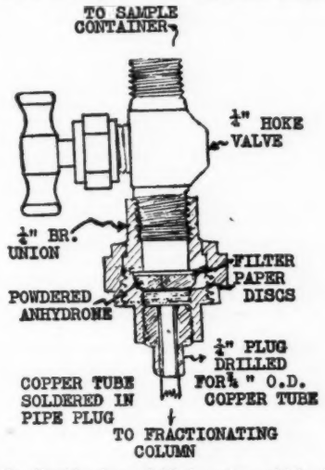
This check was made for the reason that a printed form showing these curves will now be made a part of the standardized gas contract, adopted by the association July 8, 1930.

This work was done by a subcommittee of the gas testing committee under the chairmanship of L. G. Rheinberger of the Sinclair Oil & Gas Co., with Norris Plank of the Shell Petroleum Co. and C. L. Baker of The Texas Company as members of the committee.

Removes Water From Liquid Sample For Fractional Test

By J. Louis Oberseider

In the fractional distillation analysis* of liquids for their individual chemical components, water in the sample charged to the apparatus will (1) freeze and plug the column, or (2) introduce an error in the percentage of heavier hydrocarbons present. Methods outlined in the literature to date for the elimination of this water have not been satisfactory. Draining the settled water from the sample container before connecting to the apparatus, by partly opening the bottom valve, is good procedure but does not rid



the liquid of emulsified water which, if permitted to enter the apparatus, will ruin the analysis.

An attempt to remove this emulsified water, by bending a section of the copper tubing connection between the sample container and the column into a U-tube and immersing in a gasoline bath of about —20° C. to freeze out on the walls of the tubing any emulsified water, did not work for the samples which contained an appreciable amount of water. The water froze and plugged the tubing.

Method of Removal

A simple and successful method for the removal of large quantities of emulsified water has been developed. To the bottom valve of the gasoline sample container is attached a one-fourth inch brass Hoke valve for regulating the flow of sample through the water-eliminator and into the distilling bulb of the column. Just below the seat of a one-fourth inch pipe union there is a space about five-eighths inch in diameter and three-sixteenths inch deep. With a suitable cork-borer cut eight five-eighths inch discs of filter paper and place four in the bottom of the space in the union. Place powdered anhydrone (anhydrous magnesium perchlorate), a very effective drying agent, on the paper discs and fill the space with the material. On top of the anhydrone place the remaining four discs and join this half of the union to the other half which has previously been attached to the Hoke valve. A one-fourth inch pipe plug, drilled to take three-sixteenths inch outside diameter copper tubing soldered in, is screwed tight in the bottom of the union. As little of the three-sixteenths inch tubing as is required carries the sample from the container and filter to the distilling bulb. By means of this device water-free samples are made possible even when the water content of the sample is high.

*Podbielniak, W. J., Fractional Distillation Analysis. The Oil and Gas Journal, No. 21, 28, 161 (1929).

CLOSES LARGE CONTRACT FOR LIQUEFIED BUTANE

The Utilities Gas & Electric Co. of Chicago has contracted with the Skelly Oil Co. of Tulsa for 4,000,000 gallons of liquefied butane for delivery over the next year according to an official announcement of the companies concerned.

The purchasing company through subsidiaries is a large distributor of gas in several states including Illinois, Wisconsin, Indiana, Minnesota, South Carolina, Kentucky, Louisiana and Georgia. The butane will be used in gas distribution systems operated by the company. The Skelly company has acquired a stock interest in the parent company.

The bulk of the butane will be furnished by the natural gasoline division of the Skelly company. The Skelly company also manufactures butane at its Eldorado, Kans., refinery.

The Skelly company is constantly expanding other outlets for butane and other liquefied gases manufactured by its natural gasoline department. The company is now installing its first butane-air gas distributing system in a town located in Iowa.

PLANT IN BECKHAM COUNTY

The Beckham County, Oklahoma, gas field is to have another outlet. Two new plants are under construction and expect to begin operations in the near future. Work on the $125,000 casinghead gasoline plant of the Westoak Gasoline Co. and the $500,000 carbon black plant of the Oklahoma Carbon Industries, Inc., is also progressing rapidly. Both of the plants are expected to be in operation by November.

When completed these plants will consume approximately 15,000,000 feet of gas daily. The two companies are affiliated. The casinghead gas will first pass through the casinghead plant where the gasoline will be extracted and the residue gas will be piped to the carbon black plant, which is located about 3 miles distant, where it will be burned in the manufacture of carbon black.

TO INVESTIGATE METERS

Natural gasoline manufacturers have asked the Natural Gasoline Association to call the attention of meter manufacturers to the broad band of ink resulting on the ordinary 24-hour indicator card when taking volume measurements of gas. The broad mark is probably produced by the rapid change of gas pressure in the field and because the card moves at a slow rate the indicator pen works back and forth at right angles to the direction of travel for the card much faster than it progresses along the time circle and a band of ink is produced instead of a well-defined line.

The association is investigating the problem with meter manufacturers and the work is progressing under a committee headed by D. A. Sillers of the Lone Star Gas Co., Dallas, Tex., as chairman.

NAME PROGRAM COMMITTEE

A committee of four members has been chosen to arrange the program for the next annual meeting of the Natural Gasoline Association of America with S. S. Smith of the Shell Petroleum Corp. as chairman. Other members of the committee are E. W. Zublin with the Texas Pacific Coal & Oil Co., G. P. Bunn of the Phillips Petroleum Co., and W. W. Robinson of The Texas Company of California. The annual meetings of the association are held in Tulsa and the next one will be in the third week of May, 1931.

Brief Items for Petroleum Refiners

Elect O. L. Cordell Vice President of Phillips Company

O. L. Cordell, who has been vice president in charge of sales for the Independent Oil & Gas Co., has been elected vice president of the Phillips Petroleum Co. in charge of refinery operations and the tank car sales division. The action follows the recent acquisition of the Independent properties by the Phillips company.

Mr. Cordell will continue to have his headquarters in Tulsa. He will have general charge of the Phillips refinery at Borger, Tex., and the two plants acquired from the Independent company which are located at Okmulgee, Okla., and Kansas City, Kans. Mr. Cordell, who is well known in Mid-Continent refining circles, was connected with the Phillips company previous to joining the Independent organization. With associates he organized the Alamo Refining Co. and built a small refinery at Borger, Tex. He joined the Phillips company when it purchased the refinery which marked the entry of the Phillips organization into the refining and marketing divisions of the oil business. The Borger refinery has since been enlarged and an improvement program is now under way which will increase its capacity to approximately 25,000 bbls. daily.

Station Department

Several changes in the bulk and retail station department of the Phillips Petroleum Co. have also become effective since the consolidation with the Independent Oil & Gas Co. H. E. Wormhoudt, former sales manager for the Independent company has been transferred to the home office as district manager. It is expected that he will have his headquarters at Des Moines where he will be in general charge of the Kansas City.

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SINCLAIR ENTERS LOUISIANA

RICHMOND, Va., Oct. 13.—The Sinclair Oil Refining Co. has purchased 150 filling stations and bulk stations of the Shreveport Oil Co. and other companies operating in Louisiana. These purchases give the Sinclair company 23 service stations in New Orleans and 36 bulk stations throughout the State.

Entry of the company into Louisiana in an aggressive manner, with plans for early business in Mississippi, followed the purchase recently of the Pierce Petroleum Corp. by the Sinclair interests. George S. Norman, formerly St. Louis division head for Pierce, has just opened offices at New Orleans for Sinclair. He announced that 50 additional filling stations would be opened in New Orleans, and others throughout the State within a short time.

PHILLIPS BUYS TERMINAL SITES

The Phillips Petroleum Co. has purchased two sites for the erection of tankage and terminal facilities along its gasoline line which will reach from its refinery in Borger, Tex., to St. Louis, Mo. The larger of these sites is located on the Illinois side of the Mississippi River opposite St. Louis, Mo., and will serve as the loading point for water shipments along the river. This site includes 288 acres.

The other land purchased is located 2 miles south of Wichita, Kans., and will serve as a major distributing point for the midwestern business. The company is building spur tracks to permit shipping products over several railroads. Another major terminal will be located in Kansas City near the company's refinery.

NEW GASOLINE SPECIFICATIONS NOW APPROACH FINISHED FORM

WASHINGTON, D. C., Oct. 12.—A complete copy of the proposed specifications for United States Government Motor gasoline, Motor Fuel T, Motor Fuel F and Motor Fuel V has been compiled by the Federal Specifications Board for final consideration by the industry. Comments on these specification changes have been offered from time to time by the industry through the American Petroleum Institute and the D2 committee of the A.S.T.M. and the form now being circulated by the board represents the finished proposal except that the board will entertain suggestions on points not already discussed. The government body asks that these suggestions be submitted by November 19 in order to be given consideration by the technical committee.

The revised specifications include a vapor pressure limit for each of the four grades of gasoline, a new requisite and one which many refiners and natural gasoline manufacturers feel is essential but the limits chosen are too stringent. The distillation points to be met by the respective grades are outlined below along with the newly adopted vapor pressure limits for these grades.

United States Government Motor Gasoline

Distillation Range — Method 100.13. When the thermometer reads 75° C. (167° F.) not less than 10 per cent shall be evaporated.

When the thermometer reads 140° C. (284° F.) not less than 50 per cent shall be evaporated.

When the thermometer reads 200° C. (392° F.) not less than 90 per cent shall be evaporated.

The endpoint shall not be higher than 225° C. (437° F.).

The residue shall not exceed 2 per cent.

Per cent evaporated shall be found by adding the distillation loss to the amount collected in the receiver at each specification temperature.

Sulphur—Method 520.11. Sulphur shall not exceed 0.10 per cent.

Vapor Pressure—Reid Method. The vapor pressure at 37.8° C. (100° F.) shall not exceed 10 pounds per square inch.

If the temperature at which 10 per cent is evaporated is not below 50° C. (140° F.), the vapor pressure test shall not be required.

Motor Fuel T

Distillation Range—Method 100.13. When the thermometer reads 75° C. (167° F.) not less than 10 per cent shall be evaporated.

When the thermometer reads 140° C. (284° F.) not less than 50 per cent shall be evaporated.

When the thermometer reads 200° C. (392° F.) not less than 90 per cent shall be evaporated.

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NEW CASE GOODS DOCK

LOS ANGELES, Calif., Oct. 11.—On November 15 Los Angeles will open its new $300,000 case goods oil terminal on Mormon Island. The new gasoline and kerosene terminal, said to be the most modern structure of its kind in the world, is 560 feet long and will have storage capacity for 250,000 cases of petroleum products, so that approximately two ship loads may be simultaneously assembled for expeditious loading. To this first unit, at Berth 181, another terminal, 440 feet long, will ultimately be built; thus giving the port a 1,000-foot oil-loading pier.

Upon completion of the unit, all cased gasoline loading will be centered at Berth 181, except those cargoes loaded at private terminals. Case-oil exports from Los Angeles Harbor now approximate 450,000 cases monthly.

WHITE OAK OPENS OFFICE

CHICAGO, Oct. 11.—The White Oak Refining Co. has opened an office in this city for the sale of its products. The office is at Room 631 in the Central Trust Bank Building at 208 South LaSalle Street. It will be under the management of George Williams, a well-known sales manager, who was for 12 years connected with the Johnson Oil Refining Co., and up to the beginning of this month in charge of the sales offices of the Transcontinental Oil Co. (now the Marathon Oil Co.), in this city.

ENLARGE BIG HORN PLANT

The Big Horn Oil & Refining Co., which recently put into operation at Billings, Mont., a topping plant with a daily gasoline production of 250 bbls., has started construction on a shell type still for the manufacture of lubricating oils. A second tube still for gasoline manufacture will also be constructed. The work is scheduled for completion within 60 days.

INSTALL CRACKING UNIT

The International Refining Co. (subsidiary of The Texas Company) is installing a De Florez cracking unit at its Sunburst, Mont., refinery. The new unit will be used in the production of anti-knock gasoline for distribution in the Montana marketing territory. Other improvements are being made at the Sunburst refinery.

ENLARGE ILLINOIS OIL PLANT

CUSHING, Okla., Oct. 14.—The Illinois Oil Co. will increase the capacity of its refinery here to 5,000 bbls. per day. This plant has been shut down for several months but will resume operations as soon as the construction work is completed.

WISCONSIN ASSOCIATION MEETS

MILWAUKEE, Wis., Oct. 11. — The date of the October meeting of the Wisconsin Petroleum Association has been changed to October 22. The meeting will be held at the Loraine Hotel, Madison, Wis.

RUMANIAN KEROSENE AVAILABLE IN EAST

NEW YORK, Oct. 11.—Cables from London to a local export petroleum operator this week offer Rumanian kerosene for shipment to New York or other North Atlantic United States ports, "laid down at a price to compete with the United States product."

This development following the recent shipment of Russian gasoline into Baltimore, and circulation of reports of additional cargoes of Russian gasoline for other Atlantic Coast ports, has aroused considerable interest in local market circles.

STANDARD CO. STARTS HANDLING TELEGRAMS

CHICAGO, Oct. 13. — Beginning this week, 1,630 service stations of the Standard Oil Co. (Indiana) will accept telegrams for forwarding over the wires of the Postal Telegraph Co. These messages will be forwarded by the station attendant to the nearest Postal office by telephone or messenger. Incoming messages will not be handled.

Signs of the Postal Telegraph Co. will be displayed at the Standard stations, chiefly in the larger cities at the beginning though plans are being prepared for the extension of this service to all of the 8,200 stations of the company. There will be 308 such stations in Chicago, 122 in Milwaukee, 112 in St. Louis, 53 in Kansas City, 50 in Minneapolis, 40 in Detroit, and 32 in Des Moines.

ORGANIZE DEVELOPMENT CO.

NEW YORK, Oct. 11.—Petroleum Conversion Corp. of New York and Bataafsche Petroleum Co., controlled by Royal Dutch Co. and Shell Transport & Trading Co., have formed a new company known as the Nieuwe Octrooi Maatschappij. The new company is registered at the Hague, and was formed to acquire and exploit inventions, to apply systems covered by such patents and to deal in any article manufactured from them.

R. G. A. van der Woude is managing director of the new company, and is on the board, other members of which are Walter Burton Baldry, J. B. Aug. Kessler. J. E. F. DeKok and Fred B. Lloyd. Capital of the new company is 250,000 florins.

AWARD GASOLINE CONTRACTS

WASHINGTON, D. C., Oct. 13.—The Navy Department has awarded contracts for approximately 1,895,000 gallons of aviation gasoline. Those receiving contracts include the following: Standard Oil of Kentucky, 940,000 gallons at $114,680; Atlantic Refining Co., 830,000 gallons at $104,118; and Richfield Oil Corp., 97,000 gallons at $14,880.

The department previously awarded contracts for domestic gasoline at total cost of $313,758. These contracts included the following: The Texas Company, 1,101,600 gallons at $105,663; Standard Oil Co. of New York, 498,000 gallons at $51,103; Standard Oil Co. of New Jersey, 1,040,000 gallons at $76,220, and Sinclair Oil Refining Co. 171,750 gallons at $19,278.

FIRST NAPHTHA SHIPPED

MUSKEGON, Mich., Oct. 13.—The first car load of naphtha manufactured at the refinery of the Roosevelt Oil Co. was shipped from Mount Pleasant last week. With the recent installation of equipment for the manufacture of naphtha the Roosevelt refinery expects to produce about two car loads a day. Gasoline, kerosene and specialty products will be produced. Further enlargements at the plant will make possible the manufacture of lubricants in the near future, it was said.

GREAT LAKES PIPE TERMINAL

MINNEAPOLIS, Minn., Oct. 11.—The Crescent Oil Co., northwest distributor for Continental Oil Co., states that Great Lakes Pipe Line Co. will build a 3,000,000-gallon gasoline storage plant 10 miles south of Minneapolis and St. Paul. The Great Lakes Pipe Line Co., owned by Continental Oil Co., Barnsdall Corp. and other companies, is laying a pipe line from Barnsdall, Okla., to Kansas City, Des Moines, Chicago, Omaha, Council Bluffs and the Twin Cities.

Field Problems and Their Solution

EDITED BY THOMAS F. SMILEY

In order that men connected with the drilling, producing and transporting branches of the petroleum industry may procure quickly a solution of many problems confronting them from time to time in their work, The Oil and Gas Journal has arranged with leading engineers and other recognized authorities to answer questions submitted by readers of this publication pertaining to the work of drilling and producing crude oil and transporting this product.

Everyone is invited to submit questions freely. These questions will be submitted to proper authorities by Mr. Smiley, who edits the page, and answers, based on the best available information, will be published. Each question should give as much detail as possible, especially where it relates to matters where depths of sands, types of sands and operations on adjoining properties would have a bearing on the problem involved. The source of all questions will be considered as confidential and only initials will be published in connection with the question.

In this connection, The Oil and Gas Journal will be glad to publish articles from field men who have devised new methods or practices which are improvements.

In case an immediate answer is important, one will be given by mail if the writer requests it.

FINDING POWER REQUIREMENTS

In choosing power for deep well drilling, say 7,000 feet, how are the power requirements determined? Is there a ready formula that satisfies the horsepower necessary? I have been told that with equipment for a 7,000-foot well an oil engine must handle 200 tons and I would appreciate it if you will tell me how this figure is arrived at.—A. W. H.

In rotary drilling they are using four types of prime movers, steam, gas and oil engines and electric motors, so the method used in determining the size unit to use for any particular well will depend largely upon the type of power to be used.

The formula for determining horsepower is the same for a rotary outfit as for any other piece of machinery. Weight times speed divided by 33,000 feet pounds will give horsepower.

This department does not know how the 200-ton load was arrived at but if you will refer to an article in the January 30, 1930, issue of The Oil and Gas Journal on rotary drilling conditions in Oklahoma City Pool you can get full details of casing and drill pipe used in those 6,500-foot holes. The longest and heaviest string of drill pipe of which this department has knowledge would not exceed 58 tons in weight.

Gas engines used in rotary drilling at this time are of the six-cylinder type, operating on gas or gasoline and have ratings of 140 to 250 horsepower each. The Diesel type oil engine is being introduced into the rotary operations but no data regarding them is at hand.

For Oklahoma City Pool they estimated their power requirements as follows:

	Steam power horsepower	Electric power horsepower
Drawworks	450	450
One pump	325	325
One pump	325	325
Total	1,100	1,100

WHAT TYPE OF HOLE?

We would very much appreciate advice as an aid to determining the type of hole that would be most suitable for our conditions.

In planning test holes for petroleum in a wildcat field where any sort of machine repairs are most difficult, transportation of machinery is a big item, and skilled labor is unobtainable, it seems to us that the safest procedure would be to contract with one of the many companies that make a specialty of such work to do the drilling for us, and to employ a geologist to keep the records. Further, our funds are limited so we want to prove or disprove the field as cheaply as possible, as we have another field farther from the market where we are practically sure of an abundant supply of petroleum.

Upon consulting various contracting companies we find that the proposals presented represent a wide divergence of practice, which involves a big difference in cost of casing. For a hole 3,000 feet deep one company recommends starting drilling in the solid rock with a 6-inch hole and bottoming with 4-inch, while two other companies recommend cementing 3½ to 4½-inch casing in the bedrock and continuing a 2¾ to 3-inch hole right down to the required depth.

The drilling sites are close to a railway, and the country is flat and roads are good. However, getting equipment and casing into the country is unusually costly on account of the great distance from the United States and the excessive freight rates in Bolivia.

The country to be drilled is covered with from 250 to 500 feet of alluvial. Below that we have the usual slates, shales, quartzites, etc., which have been classified as Silurian and Devonian.—C. L. B., Bolivia.

From what you say it would appear that the contracting companies are guided in their proposals by the type of equipment they have available for this proposed work, more perhaps than by considerations of the efficiency of drilling. By that is meant that if one contractor has available a large diamond drill outfit he has proposed to drill a 6 and 4-inch hole because he expects that when it is completed you might be able to use it in producing from the oil sands if they are found productive.

Wells drilled in South American fields with diamond drills have been produced successfully and this might be the major feature influencing the proposer who recommends the larger holes. If you do not expect to use the diamond drill hole to produce the well after it is completed it does not seem probable that the extra expense of the larger casing would be justified.

Makers of diamond drill outfits list only one size machine as suitable for drilling below 2,000 feet and there may be a question as to whether smaller machines would penetrate to 3,000 feet in a satisfactory manner.

If you are assured that the proposers who offer to drill the smaller holes can complete them to a 3,000-foot depth with their equipment, and you do not desire to use this hole afterward for producing it looks as though you would be safe in contracting for the smaller holes.

SHALE GAS WELL EQUIPMENT

Where can I obtain information concerning the proper equipment and care of shale gas wells and the different methods of equipping these wells?—C. E. L.

Two articles prepared by L. G. E. Bignell, petroleum engineering editor of The Oil and Gas Journal, are likely to be of assistance to you. They are "Potential Missouri-Kansas Oil Fields," in the issue of November 14, 1929, and "Gas Field on Kansas Airport Property," December 20, 1929. Nothing else that pertains to this particular problem comes to mind except general information about finishing wells given in bulletins issued by the United States Bureau of Mines, Bartlesville, Okla. If you write the Bureau of Mines at Bartlesville that institution will be glad to send you a list of such bulletins and technical papers as it has for distribution and among them you may find information of interest to you.

WHY WAS IT CALLED THAT?

FROZEN

When casing sticks as the result of cavings lodging against it or from any other condition its action is much as if ice had formed around it, so the driller says it has frozen. This difficulty frequently is experienced in soft formations where it is necessary to underream the casing and carry it down as drilling proceeds. It has resulted, too, from making the circulating mud too thick. Various fishing measures are employed to remove frozen casing.

DRILLING IS EXPENSIVE

Drilling an oil well must be a very expensive thing now that the holes are carried to such great depths. Can you give me an idea of what it costs to drill a well today, in the Oklahoma City Field, say? How is the cost arrived at? Does the cost increase with increasing depth of the hole? What are some of the major items of expense in drilling in the Oklahoma City Field?—L. N. G.

You are quite right in your belief that drilling a deep oil well is an expensive undertaking. All equipment must be high grade and many special kinds of appliances are required.

During the last two years the Petroleum Experiment Station, maintained by the United States Bureau of Mines, Department of Commerce, and the State of Oklahoma in Bartlesville, Okla., has collected data on the Oklahoma City Field as part of its general study of oil fields and oil production methods. One of the interesting things in this field is the height of the derricks. Most of them are 122 feet high, but there is one 136 feet high, one 157 feet high and one 170 feet high. This latter derrick has a 30-foot base, and is 109 feet from derrick floor to fourble run-around. A special concrete foundation for the rigs is used in this field.

It is the usual practice to construct two 25'x6'x90' slush pits and one settling pit approximately 90'x90'x2', making a total amount of 1,600 cubic yards of earth to be moved. The cellars beneath the derricks measure approximately 18 feet from the derrick floor to the top of the concrete slab. The cost of constructing the slush pits averages about $650 and the cost of digging the cellars is in the neighborhood of $225, making a total cost of excavation work at each location of about $875.

The general contract price for drilling a 12-inch or 12½-inch rotary hole and completing the well with an 8⅝-inch hole is $11 per foot. For a 6,500-foot well the drilling expense alone amounts to about $71,000.

Fuel requirements for drilling increase rapidly with the depth of the well, and operations in the Oklahoma City Pool are no exception to the rule. Batteries of three 125 horsepower or four 100 horsepower boilers are requiring as much as 500,000 cubic feet of gas per 24 hours and the total fuel requirement for completing a rotary well in this district may run as high as 50,000,000 cubic feet of gas.

The daily water requirements per well in the Oklahoma City district change somewhat with the depth of the hole. Approximate figures from wells now drilling indicate that 3,000 bbls. of water per day are required for the first 2,000 feet of hole, 2,000 bbls. of water per day from 2,000 feet to 3,000 feet, and 1,500 bbls. of water per day from 3,000 feet to the total depth of 6,500 feet. This brings the total water requirements up to about 140,000 bbls. of water to complete a well.

MORE ON FLOWING ROCKS

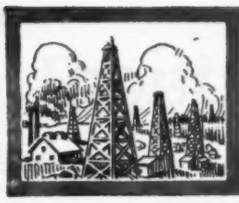
The following interesting communication adding to the discussion concerning the fluidity of rocks has been received:

"Just read your answer to the question as to whether rock flows. I should be in bed but will sneak a few more minutes to shoot you a thought or two out of the study to which several of our recent years have been devoted—dynamic geology as it relates to the occurrence of petroleum.

"The trouble with both question and answer is the too apparent thought of the earth as a brittle mass. The earth is an organism, it feeds and grows and has its metabolic processes just as has any other organism. It is not a heap of dirt the refuse of the centuries but rather to be regarded as fluid than as brittle. Its brittleness is merely relative to our very watery conception of things—we are some 90 per cent water.

"All matter is simply force static. This includes what we commonly know as rock. A radio wave passes—(waves its way) through rock. Every rock compound is merely the result of the forces bearing upon and equipoised within it and it can be and is continuously in a state of alteration. Was not it Newton who said that rest was merely a continued state of motion? Well that is it, it is solid only because it 'rests' long in our short-lived observation. It is really doing something, it is changing, and this change can best be called a flow and thus your questioner should have been told that all rock is not only flowing but is a state of flow.

"Possibly oil men can make this more clear by citing field practice. We send out sundry geophysical crews. These instruments are measuring not the rock itself but the forces bearing upon that rock and reacting or ricocheting from that rock and hence they are recording the state of that rock. Some like the seismograph disrupt the state and record the reaction against the disruption. In either case it is force and not matter which is being registered. In point it is interesting to note that the practice of using both the magnetometer and the torsion balance in the field preceded the statement of the mathematical fact of the identity of these 'two' forces. They are, as Einstein says, but one. Possibly a more practical statement along this line could be of interest but my wife and manager says I have got to go to bed so I'll close with a brief remark: Gravity is the movement towards the earth of that force of which the earth is made. This is the cosmic ray of which Millican owns the published rights and on which he will undoubtedly have some interesting things to say in his forthcoming paper. Magnetism is the result of the reception by the earth of this cosmic ray and its deflection due to the different speeds of the surface at its different latitudes. They are the same force but it's a sort of before-and-after-taking act."—N.



REFINERY AND CRUDE PRICES

Quotations on refined products are for interstate or export movement unless otherwise noted.

GASOLINE AND NAPHTHA

OKLAHOMA (Group 3)—	Oct. 14		Oct. 7		Sept. 30	
50-52 450 endpoint	.05½	.06¼	.05¾	.06¼	.05¾	.06¼
56-58 450 endpoint	.05¼	.06	.05¾	.06	.05¾	.06
*58-60 437 endpoint (U. S. Motor)	.0619		.0629		.0627	
*60-62 437 endpoint	†.05¾	.06	†.06¼	.06½	†.06¼	.06½
*60-62 400 endpoint	.0663		.0681		.0681	
*64-66 375 endpoint	†.06¼	.06½	†.06¾	.07¼	.0725	
68-70 360 endpoint	.06¾	.07¼	.07	.07¼	.07¼	.07½
64-66 437 endpoint (blend)	.05½	.06	.05¾	.06¼	.05¾	.06¼
NORTH TEXAS—						
50-52 450 endpoint	.05¼	.05½	.05½	.05¾	.05¾	
58-60 450 endpoint	.05¼	.05½	.05½	.05¾	.05¾	
58-60 437 endpoint (U. S. Motor)	.05¼	.05½	.05½	.06	.05¾	.06
60-62 400 endpoint	.05½	.05¾	.05¾	.06	.06	.06¼
64-66 390 endpoint	.05⅝	.05¾	.06	.06¼	.06¼	.06½
64-66 375 endpoint	.05¾	.06	.06⅛	.06¼	.06⅜	.06¾
68-70 360 endpoint	.06¼	.06½	.06¾	.07	.07	.07¼
64-66 437 endpoint (blend)	.05¼	.05½	.05¼	.05¾	.05¾	.06
*NORTH LOUISIANA—						
58-60 437 endpoint (U. S. Motor)	.06½	.07	.06¾	.07	.07	
*ARKANSAS—						
58-60 437 endpoint (U. S. Motor)	.06½	.07	.06¾	.07	.07	
PENNSYLVANIA—						
52-54 Naphtha	.06¾		.06¾		.06¾	
54-56 Naphtha	.06¾	.07	.06¾	.07	.06¾	.07
58-60 Gasoline	.06½	.06¾	.06½	.06¾	.06¾	.07
60 Gasoline	.06¾	.07	.06¾	.07	.07	.07¼
62 Gasoline	.07	.07¼	.07¼	.07½	.07¾	.08
64 Gasoline	.07½	.08	.07½	.08	.07¾	.08
68-70 350 endpoint gasoline	.08½	.08¾	.08½	.08¾	.08½	.08¾
CALIFORNIA—						
†58-60 437 endpoint (U. S. Motor) domestic	.08½	.10½	.08½	.10	.08	.09½
†60-62 400 endpoint domestic gasoline	.10	.11½	.09½	.11	.09	.10½
CHICAGO DISTRICT (Based on Group 3)—						
50-52 450 endpoint (Naphtha)	.05½	.05¾	.05⅝	.06	.05¾	.06
56-58 450 endpoint	.05½	.05¾	.05⅝	.06	.05¾	.06
58-60 437 endpoint (U. S. Motor)	.05¼	.05½	.05⅝	.06¼	.05¾	.06
60-62 400 endpoint	.05½	.06	.06	.06½	.06⅛	.06¼
64-66 375 endpoint	.06	.06½	.06⅛	.06¾	.06⅜	.06½
68-70 360 endpoint	.06¼	.06½	.06⅝	.07	.06¾	.07
64-66 437 endpoint (blend)	.05¾	.06¼	.05¾	.06¼	.06⅛	.06½
‡GULF COAST (Export)—						
58-60 U. S. Motor	.07		.07		.07	
60-62 400 endpoint	.075		.075		.075	
61-63 390 endpoint	.0775		.0775		.0775	
64-66 375 endpoint	.08		.08		.08	

*Weighted average prices October 13, 6 and September 29 as reported by representative refiners. Sales to jobbers only. †No sales reported. Prices show general market.

*Louisiana, Arkansas, Mississippi and East Texas delivery. †For local consumption. ‡Prices posted by Export Petroleum Association, Inc.

NATURAL GASOLINE

OKLAHOMA (Group 3)—	Oct. 14		Oct. 7		Sept. 30	
Grade A, 72-79.9, 375 e.p., rec. 90%	.05¾		.06		.06	
Grade AA, 80-87.9, 375 e.p., rec. 90%	.05¾		.06		.06	
Grade B, 76-83.9, 375 e.p., rec. 85%	.05¾		.06		.06	
Grade BB, 84-92, 375 e.p., rec. 85%	.05¾		.06		.06	
Grade C, 80-92, 375 e.p., rec. 78%	.05¾		.06		.06	
NORTH TEXAS—						
Grade A, 72-79.9, 375 e.p., rec. 90%	.05¾		.06		.06	
Grade AA, 80-87.9, 375 e.p., rec. 90%	.05¾		.06		.06	
Grade B, 76-83.9, 375 e.p., rec. 85%	.05¾		.06		.06	
Grade BB, 84-92, 375 e.p., rec. 85%	.05¾		.06		.06	
Grade C, 80-92, 375 e.p., rec. 78%	.05¾		.06		.06	
NORTH LOUISIANA—						
Grade AA, 80-87, 375 e.p., rec. 90%	.05¾	.06	.06	.06¼	.06	.06¼
Grade BB, 84-92, 375 e.p., rec. 85%	.05¾		.06		.06	
Grade C, 80-92, 375 e.p., rec. 78%	.05¾		.06		.06	
CALIFORNIA—						
75-78, 375-390 endpoint	.07	.08½	.07	.08½	.07	.08¼
CHICAGO DISTRICT (Based on Group 3)—						
Grade A, 72-79.9, 375 e.p., rec. 90%	.05¾		.06		.06	
Grade AA, 80-87.9, 375 e.p., rec. 90%	.05¾		.06		.06	
Grade BB, 84-92, 375 e.p., rec. 85%	.05¾		.06		.06	

BURNING OIL

OKLAHOMA (Group 3)—	Oct. 14		Oct. 7		Sept. 30	
41-43 water white kerosene	.03⅛	.03¾	.03⅛	.03¾	.03⅛	.03¾
42-44 water white kerosene	.03⅜	.04	.03½	.04	.03½	.04
NORTH TEXAS—						
41-43 water white kerosene	.03	.03¼	.03	.03¼	.03	.03¼
40-41 water white kerosene	.02⅞	.03	.02⅞	.03	.02⅞	.03
*NORTH LOUISIANA—						
41-43 water white kerosene	.04	.04¼	.04	.04¼	.04¼	.04½
*ARKANSAS—						
41-43 water white kerosene	.04	.04¼	.04	.04¼	.04¼	.04½
PENNSYLVANIA—						
*43 Kerosene prime white	.04¾		.04¾		.04¾	
45 Kerosene water white	.05	.05¼	.05	.05¼	.05¼	
46 Kerosene water white	.05	.05¼	.05	.05¼	.05¼	
300 Mineral Seal	.05½		.05½		.05½	
CALIFORNIA—						
38-40 water white Kero. (high burning test)	.04¾	.06	.04¾	.06	.04¾	.06
CHICAGO DISTRICT (Based on Group 3)—						
41-43 water white kerosene	.03¼	.03½	.03⅛	.03½	.03⅛	.03½
42-44 water white kerosene	.03½	.03¾	.03½	.03¾	.03½	.03¾
†Gulf COAST (Export)—						
41-43 prime white	.06		.06		.06	
41-43 water white	.05		.05		.05	

*Louisiana, Arkansas, Mississippi and East Texas delivery. †Prices posted by Export Petroleum Association, Inc.

FUEL OIL

OKLAHOMA (Group 3)—	Oct. 14		Oct. 7		Sept. 30	
Below 18 Fuel Oil, per bbl.	.45	.50	.45	.50	.45	.50
18-22 Fuel Oil, per bbl.	.47½	.52½	.47½	.52½	.47½	.52½
20-22 Fuel Oil, per bbl.	.50	.57½	.50	.57½	.50	.57½
22-26 Fuel Oil, per bbl.	.55	.60	.55	.60	.55	.60
24-26 Fuel Oil, per bbl.	.65	.70	.65	.70	.65	.70
26-30 Fuel Oil, per bbl.	.70	.80	.70	.75	.70	.75
28-30 Fuel Oil, per bbl.	.85	.90	.80	.85	.75	.85
32-36 Gas Oil (industrial)	.02⅛	.02¼	.02⅛	.02¼	.02⅛	.02¼
32-36 Gas Oil (straw color, high cold test)	.02¼	.02½	.02¼	.02½	.02¼	.02½
32-36 Gas Oil (straw color, low cold test)	.02⅝	.02¾	.02⅝	.02⅞	.02⅝	.02⅞
36-38 Distillate	.02⅜	.02½	.02⅜	.02⅝	.02⅜	.02⅝
38-40 Straw Distillate	.02¾	.03¼	.02¾	.03¼	.02¾	.03¼
38-40 Straw Distillate (low cold test)	.03	.03¼	.03	.03¼	.03	.03¼
NORTH TEXAS—						
Below 20 Fuel Oil, per bbl.	.35	.50	.40	.50	.40	.50
24-26 Fuel Oil, per bbl.	.55	.65	.60	.65	.60	.65
32-36 Gas Oil (industrial)	.02	.02¼	.02	.02¼	.02	.02¼
38-40 Straw Distillate	.02¾	.03	.02¾	.03	.02¾	.03
*NORTH LOUISIANA—						
18-20 Fuel Oil, per bbl.	.80	.85	.80	.85	.80	.85
30-32 Gas Oil	.02⅞		.02⅞		.02⅞	
*ARKANSAS—						
33-36 Distillate	.02¾	.03	.02¾	.03	.02¾	.03
30-32 Gas Oil	.02¾	.02⅞	.02¾	.02⅞	.02¾	.02⅞
16-22 Refinery Fuel Oil, per bbl.	.65	.70	.65	.70	.65	.70
GULF COAST (South Texas)—						
Gas Oil	.03¾		.03¾		.03¾	
Bunker C Fuel (cargo lots), per bbl.	.65	.70	.75	.80	.75	.80
Bunker C Fuel (small lots)	1.00		1.00		1.00	
PENNSYLVANIA—						
30-34 Fuel Oil	.04		.04		.03⅝	
36-40 Fuel Oil	.04	.04¼	.04	.04¼	.04	.04¼
CALIFORNIA—						
33-36 Distillate	.02	.02½	.02	.02½	.02	.02½
26-32 Distillate	.01¾	.02	.01¾	.02	.01¾	.02
15-20 Fuel Oil, Bunker (at tidewater)	.65	.95	.65	.95	.65	.95
15-20 Fuel Oil (cargo lots), per bbl.	.55	.85	.55	.85	.55	.85
27 plus Diesel, per bbl.	.85	1.00	.85	1.00	.85	1.00
CHICAGO DISTRICT (Based on Group 3)—						
22-26 Fuel Oil, per bbl.	.60	.65	.52½	.57½	.52½	.57½
18-22 Fuel Oil, per bbl.	.52½	.60	.47½	.52½	.47½	.52½
28-30 Fuel Oil, per bbl. (zero)	.87½	.92½	.87½	.92½	.80	.85
32-36 Gas Oil (zero)	.02½	.02⅞	.02⅜	.02¾	.02½	.02¾
32-36 Gas Oil (industrial)	.02¼	.02⅜	.02¼	.02⅜	.02¼	.02⅜
38-40 Straw Distillate	.02¾	.03	.02¾	.03	.02¾	.03

*Louisiana, Arkansas, Mississippi and East Texas delivery.

LUBRICATING OIL AND WAX

OKLAHOMA (Group 3)—	Oct. 14		Oct. 7		Sept. 30	
100 vis., 2 color, 20-25 cold test	.06	.06½	.06	.06½	.06	.06½
100 vis., 3 color, 20-25 cold test	.05½	.06	.05½	.06	.05½	.06
150 vis., 3 color, 20-25 cold test	.07¼	.07½	.07¼	.07½	.07¼	.07½
150 vis., 4 color, 20-25 cold test	.07		.07		.07	
180 vis., 3 color, 23-28 cold test	.08½	.09	.08½	.09	.08½	.09
180 vis., 4 color, 23-28 cold test	.08¼	.08½	.08¼	.08½	.08¼	.08½
180 vis., 5 color, 23-28 cold test	.08		.08		.08	
200 vis., 3 color, 23-28 cold test	.10	.10¼	.10	.10¼	.10	.10¼
200 vis., 4 color, 23-28 cold test	.09½	.10	.09½	.10	.09½	.10
200 vis., 5 color, 23-28 cold test	.09¼	.09½	.09¼	.09½	.09¼	.09½
240 vis., 3 color, 25-30 cold test	.13½	.14	.13½	.14	.13½	.14
240 vis., 4 color, 25-30 cold test	.12½	.13	.12½	.13	.12½	.13
240 vis., 5 color, 25-30 cold test	.11½	.12	.11½	.12	.11½	.12
280 vis., 3 color, 25-30 cold test	.15½	.16	.15½	.16	.15½	.16
280 vis., 4 color, 25-30 cold test	.14½	.15	.14½	.15	.14½	.15
280 vis., 5 color, 25-30 cold test	.13½	.14	.13½	.14	.13½	.14
Cylinder Stocks:						
600, steam refined, light green	.08	.12	.08	.12	.08	.12
600, steam refined, dark green	.05	.08	.05	.08	.06	.08
190-200 vis., D color, Bright Stocks	.30		.30		.30	
150-160 vis., D color, Bright Stock	.23	.25	.23	.25	.23	.25
*150-160 vis., D color, Bright Stock	.21	.23	.21	.23	.21	.23
150-160 vis., E color, Bright Stock	.20	.23	.20	.23	.20	.23
Waxes:						
124-126 White Crude Scale Wax	.02	.02⅛	.02	.02⅛	.02	.02⅛

*High cold test. All bright stock prices are for domestic movement.

PENNSYLVANIA—						
34 Neutral	.05½	.06½	.05½	.06½	.05½	.06½
34 Sundebloom	.05½		.05½		.05½	
36 Miners' Neutral	.05¾		.05¾		.05¾	
150, 3 color	.11½	.13	.11½	.13	.11½	.13
180, 3 color	.16	.17	.16	.17	.16	.17
200, 3 color	.17½	.18	.17½	.18	.18	.19½
220, 3 color	.21	.22	.21	.22	.23	
600, steam refined	.11	.12	.11	.12	.11	.12
635, steam refined	.16	.17	.16	.17	.16	.17
650, steam refined	.15½	.16½	.16½	.17	.16½	.17
600, Pennsylvania Flash	.17	.18	.17	.18	.17	.18
630, Pennsylvania Flash	.24½	.25½	.24½	.25½	.25	.26
600, E filtered	.15	.17	.15	.17	.15	.17
600, D filtered	.19	.21	.19	.21	.19	.21
Pennsylvania Bright Stocks	.22	.23	.23	.25	.25	
*122-124 White Crude Scale Wax	.02⅝		.02⅝		.02⅝	
124-126 White Crude Scale Wax	.02⅞		.02⅞		.02⅞	

*At New York.

GULF COAST (South Texas)—						
100 vis., 2-2½ color, pale oil	.06½	.06¾	.06½	.06¾	.06½	.06¾
200 vis., 3 color, pale oil	.08½	.09	.09½		.09½	
300 vis., 3 color, pale oil	.09¾	.10	.10¾		.10¾	
500 vis., 3½ color, pale oil	.11	.11¼	.12	.12¾	.12	.12¾
750 vis., 3½ color, pale oil	.12½	.12¾	.13½		.13½	
1,200 vis., 3½ color, pale oil	.15	.15¼	.16		.16	
2,000 vis., 6 plus color, red oil	.16	.16¼	.17		.17	

REFINERY AND CRUDE PRICES

Quotations on refined products are for interstate or export movement unless otherwise noted.

200 vis., 5-6 color, red oil	.07¾	.08	.08¾	.09	.08¾	.09
300 vis., 5-6 color, red oil	.09	.09¼	.10	.10¼	.10	.10¼
500 vis., 5-6 color, red oil	.10¼	.10½	.11¼		.11¼	
750 vis., 5-6 color, red oil	.11¾	.12	.12¾	.13	.12¾	.13
1,200 vis., 4 color, pale oil	.14	.14½	.15		.15	
2,000 vis., 4 color, pale oil	.16	.16½	.17		.17	
CALIFORNIA—						
130 vis., 2½-3 color	.09	.09½	.09	.09½	.09	.09¼
200 vis., 2½-3 color	.10	.10¾	.10	.10¾	.10	.10¾
300 vis., 3-3½ color	.10¾	.11½	.10¾	.11½	.10¾	.11¼
350 vis., 3½-4 color	.11½	.11¾	.11½	.11¾	.11½	.11¾
400 vis., 3½-4 color	.12¼	.12¾	.12¼	.12¾	.12¼	.12¾
Red Neutral:						
200 vis., 4½-5 color	.10	.10¾	.10	.10¾	.10	.10½
300 vis., 5-6 color	.10¾	.11¼	.10¾	.11¼	.10½	.11
400 vis., 5-6 color	.12	.12½	.12	.12½	.12	.12½
500 vis., 4½-5 color	.13	.13½	.13	.13½	.13	.13½
500 vis., 5-6½ color	.13	.13½	.13	.13½	.13	.13½
600 vis., 6½ plus color	.13½	.14½	.13	.14½	.13	.14

Note—Bright stocks are not manufactured commercially on the Pacific Coast.

NEW YORK (BAYONNE) REFINERY PRICES

	Oct. 14		Oct. 7		Sept. 30	
Gasoline, U. S. Motor, 58-60 437 e.p.	.07¾		.07¾		.07¾	
Kerosene, water white, 41-43	.06¾		.06¾		.06¾	
*Fuel Oil, Bunker "C," 41-43	1.05		1.05		†1.05	
Fuel Oil, Diesel. 28-30, per bbl.	2.00		2.00		2.00	
Gas Oil, 28 gravity plus	.04¾	.05¼	.04¾	.05¼	.04¾	.05¼
25 pale Paraffin Oil, tank car	.10¼		.10¼		.10¼	
28 pale, Paraffin Oil, tank car	.07¼		.07¼		.07¼	
280 red Paraffin Oil, tank car	.12½		.12½		.12½	
250 red Paraffin Oil, tank car	.11½		.11½		.11½	
225 red Paraffin Oil, tank car	.10		.10		.10	
200 red Paraffin Oil, tank car	.09¼		.09¼		.09¼	
Refined Wax:						
120-122 a.m.p., per lb.	.03		.03⅛		.03⅛	
125-127 a.m.p., per lb.	.03¼		.03⅜		.03⅜	
130-132 a.m.p., per lb.	.03⅜		.03¾		.03¾	
133-135 a.m.p., per lb.	.04⅜		.04⅜		.04½	
135-137 a.m.p., per lb.	.046		.046		.04⅝	
Petrolatum in barrels, in carload lots, per pound:						
Dark Green	.01¾		.01¾		.01¾	
Amber	.03¼		.03¼		.03¼	
Extra Amber	.03⅜		.03⅜		.03⅜	
Cream	.06		.06		.06	
Lily White	.06¾		.06⅝		.06⅝	
Snow White	.08		.08		.08	

*Lighterage 5.0 cents a barrel extra. †Correct price September 30, $1.05.

NEW YORK (BAYONNE) EXPORT PRICES

	Oct. 14	Oct. 7	Sept. 30
600, steam refined cylinder stocks, in bbls.	.16½	.16½	.17
635, steam refined	.18½	.18½	.19
650, steam refined	.22½	.22½	.23
600, Pennsylvania Flash	.26	.28	.28
630, Pennsylvania Flash	.29	.31	.31
600, Warren E	.24	.24	.24
600, Oil City E	.23	.23	.23
Light 140-150 Bright Stocks	.29	.29	.30
Dark 140-150 Bright Stocks	.27	.27	.28

LOS ANGELES EXPORT PRICES

	Oct. 14		Oct. 7		Sept. 30	
Kerosene, water white	.04½	.06	.04½	.06	.04½	.05½
*U. S. Motor Gasoline, 53-55, 437 e.p.	.06½	.07½	.06½	.07½	.06½	.07½
*60-62, 400 endpoint gasoline	.08¼	.09½	.08¼	.09½	.08¼	.09½

*Prices on coastwise shipments.

CRUDE OIL PRICES

OKLAHOMA, KANSAS, NORTH AND EAST CENTRAL TEXAS

Oklahoma City—Same as other Mid-Continent price schedule except Empire Pipe Line Co. posted all oil 40 gravity and above at $1.43 on April 10.

Corsicana heavy (April 10, 1930).....$ .80
Other fields.....See gravity table

TEXAS PANHANDLE

Gray County, Wheeler County and Carson-Hutchinson Counties—See gravity table.

In Nocl-McConnell district, Prairie Oil & Gas Co. posted April 10, below 30 degrees, 75½ cents, with 5-cent differential upward to 34-34.9, $1.00½, and then a 3-cent differential upward to 44 and above at $1.35½.

WEST TEXAS

Iatan*.....Same as North Texas
Crane-Upton-Crockett, Pecos, Winkler, Mitchell and Ector.....
.....See gravity table, Column 3
Howard and Glasscock.....
.....See gravity table, Column 9
Chalk† (April 10, 1930).....$ .75

*Includes Westbrook Field. †Posted by Humble Oil & Refining Co.

ARKANSAS-NORTH LOUISIANA

Smackover, below 24 gravity (April 11, 1930).....$ .90
Smackover, 24 gravity and above (April 11, 1930).....1.05
Carterville, Sarepta and Cotton Valley, below 36 gravity (April 11, 1930).... .95
Bellevue (April 11, 1930)..... 1.15
Urania (April 11, 1930)..... .95
East El Dorado (April 11, 1930)..... .90
Other fields.....See gravity table

Cotton Valley crude above 36 gravity takes same gravity price schedule as shown for North Louisiana and Arkansas crude in Mid-Continent gravity price table.

Note—Smackover, Cotton Valley and Bellevue posted by Standard Oil Co. of Louisiana and Magnolia Petroleum Co.; Urania posted by Louisiana Oil Refining Corp.; East El Dorado posted by Magnolia Petroleum Co.

Grade A (April 10, 1930)*.....$1.15
Grade B, 25° and upward..See gravity table
Jennings, La., (April 10, 1930)†..... 1.10
Refugio (light).....Same as Grade B
Refugio (heavy) (April 10, 1930)‖..... .85
Sorrento (April 10, 1930)‡..... 1.10
Markham (April 10, 1930)§..... .85
High Island (April 10, 1930)¶..... .95

*Humble Oil & Refining Co. †Gulf Pipe Line Co. ‡Sun Pipe Line Co. §Texas Pipe Line Co. ¶Posted by Gulf Pipe Line Co. ‖Humble Oil & Refining Co. and Gulf Coast Pipe Line Co.

ROCKY MOUNTAIN STATES
Ohio Oil Co.-Midwest Refining Co.

(Effective April 11, 1930)

Iles (Feb. 15, 1930).....$ .87
33 gravity and above ..... .87
Under 33 gravity..... .65
Dutton Creek (Feb. 15, 1930)..... 1.25
Rock Creek, Wyo. 1.35
Salt Creek.....See gravity table
Big Muddy 1.38
Grass Creek, heavy (July 27, 1928).... .90
Grass Creek, light 1.55
Muie Creek (May 21, 1929)..... 1.20
Elk Basin 1.55

(Continued on Page 134)

CRUDE OIL GRAVITY TABLE

Gravity—	1 Oklahoma-Kansas	2 North Central Texas No. La., Arkansas	3 Crane, Upton, Ector, Crockett, Winkler, Pecos, Mitchell (West Texas) Lea, N. Mex.	4 Wheeler County (Texas Panhandle)	5 Gray County (Texas Panhandle)	6 Carson and Hutchinson (Texas Panhandle)	7 Salt Creek, Wyo.	8 Stephens, Ark.	9 Howard-Glasscock (West Texas)	10 Grade B Gulf Coast and Refugio Texas
Below 25	.75	.72	.65	....	....	....	....	....	.65	1.00
25 to 25.9	.80	.77	.68	....	....	....	....	....	.68	1.03
26 to 26.9	.85	.82	.71	....	....	....	....	....	.71	1.06
27 to 27.9	.90	.87	.74	....	....	....	....	.76	.74	1.09
28 to 28.9	.95	.92	.77	....	.75½	....	....	.81	.76	1.12
29 to 29.9	1.00	.97	.80	.75½	.80½	....	1.00	.86	.78	1.15
30 to 30.9	1.05	1.02	.83	.80½	.85½	....	1.05	.91	.80	1.18
31 to 31.9	1 10	1.07	.86	.85½	.90½	.77½	1.10	.96	.82	1.21
32 to 32.9	1.15	1.12	.89	.90½	.95½	.82½	1.15	1.01	.84	1.24
33 to 33.9	1.18½	1.17	.92	.95½	1.00½	.87½	1.18½	....	.86	1.27
34 to 34.9	1.22	1 22	.95	1.00½	1.05½	.92½	1.22	....	.88	1.30
35 to 35.9	1.25½	1.25½	.98	1.04	1.09	.96	1.25½	....	.90	1.33
36 to 36.9	1.29	1.29	1.01	1.07½	1.12½	.99½	1.29	....	.92	1.36
37 to 37.9	1.32½	1 32½	....	1.11	1.16	1.03	1.32½	....	....	1.39
38 to 38.9	1.36	1.36	....	1.14½	1.19½	1.06½	....	....	....	1.42
39 to 39.9	1.39½	1.39½	....	1.18	1.23	1.10	....	....	....	1.44
40 to 40.9	1.43	1.43	....	1.21½	1.26½	1.13½	....	....	....	1.46
41 to 41.9	1.46½	1 46½	....	1.25	1.30	1.17	....	....	....	1.48
42 to 42.9	1.50	1.50	....	1.28½	1.33½	1.20½	....	....	....	1.50
43 to 43.9	1.53½	1.53½	....	1.32	1.37	1.24	....	....	....	1.52
44 and above	1.57	1.57	....	1.35½	1.40½	1.27½	....	....	....	1.54

Column 1, Note—Above prices posted April 10, 1930, by Carter Oil Co. (beginning at 25° and below), and by the Prairie Oil & Gas Co. and other purchasers beginning at 24° and below, the Magnolia Petroleum alone excepted. The Magnolia on April 10 posted the following prices: Below 26 gravity, 70 cents; 26-26.9, 76 cents; 27-27.9, 82 cents; 28-28.9, 88 cents; 29-29.9, 95 cents; 30-30.9, $1.02. From 31 and up and including 44° and above Magnolia followed Carter price schedule, but made its whole schedule apply to its gravity purchases in Kansas, Oklahoma and North Central Texas alike.

Column 2—Humble Oil & Refining Co. posted above prices April 10, 1930, and was followed by all other companies in Texas except Magnolia which posted a different price schedule than Humble up to 33.9°. (See note in paragraph just above.) The Texas Company posted North Louisiana and Arkansas on April 10, and Standard of Louisiana posted on April 11, followed by other companies, but Magnolia's price schedule begins with below 28 gravity at 87 cents. North Central Texas includes North Texas, Ranger, Mexia, Powell, Richland, Wortham, Lytton Springs, Currie, Nocona, Moran and Corsicana light. Arkansas and Louisiana pools include Caddo, Bull Bayou, Crichton, Cotton Valley (above 36 gravity), DeSoto, Haynesville, Homer, El Dorado and Rainbow.

Column 3—Posted by Humble Oil & Refining Co. April 10, 1930, and Magnolia Petroleum Co. April 10, 1930.

Columns 4, 5 and 6—Humble Oil & Refining Co., Prairie Oil & Gas Co., Magnolia Petroleum Co., April 10, 1930.

Column 7—Midwest Refining Co., April 11. All crude over 37 gravity, $1.32½.

Column 8—Louisiana Oil & Refining Co., April 11.

Column 10—Humble Oil & Refining Co., April 10. Magnolia Petroleum Co. posted below 25 gravity, 65 cents, with 3-cent differential upward to and including 36 and above which was posted at $1.01.

CALIFORNIA CRUDE OIL PRICES

Standard Oil Co. (effective September 15, 1930), Union Oil Co. (effective September 15, 1930)

Gravity—	1 Long Beach, Seal Beach, Alamitos Hts., Huntington Beach, Torrance, Inglewood, Olinda, Richfield, Brea Canyon	2 Whittier, La Habra, Coyote Hills	3 Midway-Sunset, Elk Hills, Lost Hills, Belridge, Buena Vista Hills	4 Montebello	5 Santa Fe Springs	6 Santa Maria Coalinga	7 Wheeler Ridge	8 Orcut, Ventura, Rincon	9 Ventura Avenue	10 Elwood Terrace	11 Athens, Rosecrans, Domingues
14 to 14.9	.70	.70	.55	.70	....	.55	.55	.55	.70	....	....
15 to 15.9	.70	.70	.55	.70	....	.55	.55	.55	.70	....	....
16 to 16.9	.70	.70	.55	.70	....	.55	.55	.55	.70	....	....
17 to 17.9	.70	.70	.55	.70	....	.55	.55	.55	.70	....	....
18 to 18.9	.76	.76	.62	.71	....	.62	.62	.65	.76	....	....
19 to 19.9	.82	.82	.70	.77	....	.70	.70	.70	.82	....	....
20 to 20.9	.88	.87	.78	.83	....	.78	.78	.78	.88	....	....
21 to 21.9	.94	.93	.86	.90	.92	.86	.86	.90	.91	....	....
22 to 22.9	1.00	.98	.94	.97	.95	.94	.94	.95	.94	....	....
23 to 23.9	1.07	1.04	1.02	1.05	1.01	1.02	1.02	1.02	1.00	....	....
24 to 24.9	1.12	1.08	1.06	1.08	1.05	1.04	1.04	1.08	1.05	....	1.12
25 to 25.9	1.17	1.12	1.10	1.11	1.09	1.06	1.06	1.11	1.10	....	1.17
26 to 26.9	1.22	1.16	1.14	1.15	1.13	1.08	1.08	1.15	1.15	....	1.22
27 to 27.9	1.26	1.21	1.18	1.19	1.18	1.11	1.10	....	1.19	....	1.27
28 to 28.9	1.30	1.25	1.23	1.23	1.23	1.15	....	....	1.23	....	1.32
29 to 29.9	1.34	1.29	1.29	1 26	1.28	1.19	....	....	1.27	....	1.37
30 to 30.9	1.38	1.33	1.35	1.29	1.33	1.23	....	....	1.31	....	1.42
31 to 31.9	1.43	....	1.40	....	1.38	1.27	....	....	1.36	....	1.47
32 to 32.9	1.48	....	1.47	....	1.43	1.31	....	....	1.41	....	1.52
33 to 33.9	....	....	1.53	....	1.48	1.35	....	....	1.47	....	1.57
34 to 34.9	....	....	1.59	....	1.53	1.39	....	....	1.53	1.32	1.62
35 to 35.9	....	....	1.65	....	1.58	1.43	....	....	1.59	1.39	1.66
36 to 36.9	....	....	....	....	1.63	....	....	....	....	1.46	1.72
37 to 37.9	....	....	....	....	1.68	....	....	....	....	1.53	1.78
38 to 38.9	....	....	....	....	1.73	....	....	....	....	1.60	1.84
39 to 39.9	....	....	....	....	1.78	....	....	....	....	1.66	1.90
40 to 40.9	....	....	....	....	....	....	....	....	....	1.72	1.96
41 to 41.9	....	....	....	....	....	....	....	....	....	1.78	2.02
42 to 42.9	....	....	....	....	....	....	....	....	....	1.84	2 08

Kern River, Newhall-McKittrick, Mount Poso and Round Mountain, 11 to 12.9 gravity, 50 cents; 14 gravity and above, 55 cents, effective March 11. On March 11, the Union Oil Co. posted Midway-Sunset, Elk Hills, Buena Vista, Lost Hills and Coalinga crude as follows: 11 to 13.9 gravity at 50 cents. Fruitvale, posted by General Petroleum Co., 11-13.9, 50 cents; 14 gravity and above, 55 cents.

Column 1—Signal Hill, Seal Beach, Huntington Beach and Alamitos Heights crude, 14 to 32.9 gravity, inclusive; Richfield, Olinda-Brea and Fullerton, 14 to 30.9 gravity; Torrance and Inglewood, 14 to 28.9 gravity.

Column 2—Whittier crude, 14 to 22.9 gravity; Coyote Hills, 14 to 30.9 gravity.

Column 3—Kern River, Newhall and McKittrick, 11 to 19.9 gravity; Midway-Sunset, Buena Vista and Elk Hills, 11 to 33.9 gravity; Lost Hills, 11 to 34.9 gravity; oil below 14 gravity posted at 50 cents.

Column 5—Price change posted by Standard of California September 16.

Column 6—Oil below 14 gravity posted at 45 cents.

Column 8—Posted by General Petroleum Co.

Kettleman Hills—Union Oil Co., September 22, 35 to 39 gravity, $1.10; 40 to 44 gravity, $1.20; 45 to 49 gravity, $1.35; 50 to 54 gravity, $1.50; 55 gravity and above, $1.65. Standard Oil Co. of California, 55 gravity and above, $1.65.

TANK WAGON MARKETS

Tank wagon quotations for gasoline and kerosene in United States as furnished by the larger marketing concerns Oct. 14

ALL TANK WAGON AND SERVICE STATION QUOTATIONS INCLUDE TAXES

STANDARD OIL CO (INDIANA)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
Chicago†	16.0	17.0	3.0	11.0
Decatur, Ill.	16.4	17.0	3.0	11.1
E. St. Louis	17.4	18.4	3.0	10.2
Joliet	16.4	17.4	3.0	10.2
Peoria	16.4	15.0	3.0	11.3
Quincy	16.2	17.2	3.0	10.9
Davenport, Ia.	16.5	17.5	3.0	11.3
Des Moines	15.5	16.5	3.0	11.3
Keokuk	16.5	17.5	3.0	11.3
Sioux City	16.1	17.1	3.0	10.9
Duluth, Minn.	17.5	18.5	3.0	11.9
Mankato	17.1	15.0	3.0	11.7
Minneapolis	16.0	18.0	3.0	11.9
La Crosse, Wis.	16.2	17.2	2.0	12.0
Milwaukee	17.1	16.0	2.0	10.9
Madison	15.3	16.3	2.0	11.1
Detroit, Mich.	16.8	14.3	3.0	12.7
Grand Rapids	18.7	16.7	3.0	12.6
Saginaw	15.9	16.9	3.0	12.8
Evansville, Ind.	19.0	15.0	4.0	12.0
Indianapolis	17.9	17.2	4.0	12.2
South Bend	17.4	18.4	4.0	12.4
Fargo, N. D.	20.9	21.9	3.0	13.9
Huron, S. D.	20.3	17.5	4.0	12.7
Sioux Falls	17.1	18.1	4.0	12.4
K. C. Mo.	15.9	16.9	3.0	9.6
Springfield*	17.8	18.8	3.0	10.5
St. Louis*	14.9	15.9	2.5	10.3
St. Joseph	15.5	16.5	2.0	10.2
Wichita, Kans.	16.8	14.8	3.0	9.8
Bartlesville, Ok.	15.5	18.5	4.0	9.5

*State tax 2 cents; remainder city tax.

†Effective June 3, discounts on Q.D.A. in Chicago district 4 cents off service station price on purchases of 500 gallons or more per month and 5 cents on purchases of 1,000 gallons or more per month.

Effective August 5, the following quantity discounts from the service station prices are allowed on monthly sales of gasoline: 500 gallons or more, 2 cents; 75,000 gallons or more, 4½ cents. Discounts are allowed each month and they are not cumulative. Delivery tickets showing date and quantity delivered must be sent to the seller before the tenth of the month to secure the discount on the previous month's purchases.

ROCKY MOUNTAIN DISTRICT

Continental Oil Co.

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
Denver, Colo.	16.0	19.0	4.0	13.5
Pueblo	17.0	20.0	4.0	13.5
Grand Junction	20.5	23.5	4.0	17.0
Casper, Wyo.	17.0	20.0	4.0	12.0
Cheyenne	18.0	21.0	4.0	13.5
Butte, Mont.	19.0	22.0	5.0	18.0
Billings	20.0	23.0	5.0	16.5
Great Falls	20.0	23.0	5.0	18.0
Helena	23.5	26.5	5.0	18.0
Salt Lake, Utah	20.0	23.0	3.5	17.0
Albu'que, N. M.	16.0	20.0	5.0	15.0
Boise, Idaho	23.5	26.5	5.0	19.0
Twin Falls	23.5	27.5	5.0	19.0

SOUTHWESTERN DISTRICT

Magnolia Petroleum Co.

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
Dallas, Tex.	14.0	17.0	4.0	12.0
Fort Worth	14.0	17.0	4.0	11.0
Houston	15.0	19.0	4.0	11.0
San Antonio	13.0	17.0	4.0	11.0
El Paso	16.0	20.0	4.0	13.0
Texarkana	17.0	17.0	4.0	12.0
Muskogee*	15.0	18.0	4.0	9.0
Okla. City.*	14.0	17.0	4.0	10.0
Tulsa	14.0	18.0	4.0	10.0
Ft. Smith, Ark.	14.5	15.5	5.0	12.0
Little Rock	15.5	16.5	5.0	12.0

*Gasoline tank wagon price to dealers 1 cent under posted tank wagon.

One-cent rebate made from posted station prices to cash purchasers in Louisiana, Arkansas and Tennessee.

NEBRASKA

Standard Oil Co. (Nebraska)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
Omaha	17.25	18.25	4.0	11.25
McCook	18.75	20.75	4.0	12.75
Norfolk	17.25	17.25	4.0	11.75
N. Platte	18.75	20.75	4.0	12.50
Scott's Bluff	17.00	17.00	4.0	12.25

OHIO

Standard Oil Co. (Ohio)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
Ohio points*	18.0	19.0	4.0	†15.0

*Dealers and commercial accounts 2 cents under tank wagon.

†Service station price 16 cents.

CENTRAL SOUTH DISTRICT

Standard Oil Co. (Louisiana)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
N. Orleans, La.*	13.5	14.5	5.0	12.0
Baton Rouge	14.5	15.5	4.0	13.0
Alexandria†	16.5	17.5	5.0	13.0
Lafayette*	16.5	17.5	5.0	13.0
Lake Charles*	16.5	17.5	5.0	13.0
Shreveport	14.5	15.5	4.0	13.0
Knoxv'le, Tenn.	17.0	18.0	5.0	15.0
Memphis	15.0	16.0	5.0	12.5
Chattanooga	18.0	19.0	5.0	13.0
Nashville	16.0	17.0	5.0	15.0
Bristol	19.0	20.0	5.0	14.0
Lt. Rock, Ark.	15.0	16.0	5.0	12.0

*Includes city tax of 1 cent. Louisiana kerosene prices include 1-cent state tax. New Orleans kerosene price also includes 1-cent city tax.

†Gasoline price at Alexandria includes 1-cent tax in parish of Rapides.

One cent discount allowed off station price on all cash purchases. All other station discounts withdrawn October 2, 1930.

PENNSYLVANIA—DELAWARE AND PART NEW ENGLAND

The Atlantic Refining Co.

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
Pittsburgh, Pa.	15.0	*20.0	...	12.0
Philadelphia	15.0	*20.0	...	12.0
Scranton	15.0	*20.0	...	12.0
Allentown	15.0	*20.0	...	12.0
Altoona	15.0	*20.0	...	12.0
Erie	15.0	*18.0	...	12.0
Dover, Del	18.0	20.0	3.0	12.0
Wilmington	18.0	20.0	3.0	12.9
Springf'd, Mass.	17.5	19.5	2.0	10.0
Worcester	17.5	19.3	2.0	10.0
Boston	16.5	18.5	2.0	10.0
Providence, R.I.	13.7	14.7	2.0	10.0
Hartford, Conn.	17.5	19.5	2.0	12.5
New Haven	17.6	19.6	2.0	12.6

*Includes tax of 3 cents. Pennsylvania tax is collected by the dealer and paid by him direct to the State. The Atlantic Refining Co. recognizes a 2-cent per gallon discount on gasoline from its posted tank wagon markets on sales to dealers for purposes of resale. The Atlantic Refining Co. also recognizes a maximum discount of 2 cents per gallon on gasoline to commercial accounts under contract for one year.

SOUTHERN DISTRICT

Standard Oil Co. (Kentucky)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
Atlanta, Ga.	21.0	23.0	6.0	14.5
Augusta	22.0	24.0	6.0	15.5
Macon	22.0	24.0	6.0	13.0
Savannah	20.0	22.0	6.0	14.0
Birm'ham, Ala.	18.0	20.0	5.0	14.5
Mobile	19.0	21.0	4.0	11.5
Montgomery	20.0	22.0	4.0	15.0
Clarks'le, Miss.	19.0	21.0	5.0	12.5
Jackson	17.0	19.0	5.0	13.0
Natchez	19.0	21.0	5.0	13.0
Gulfport	20.5	22.5	5.0	13.0
Vicksburg	19.0	21.0	5.0	13.0
Jack'ville, Fla.	19.0	19.0	6.0	14.0
Miami	21.0	23.0	6.0	14.0
Pensacola	20.0	21.0	6.0	13.5
Tampa	20.0	20.0	5.0	13.0
Lexington, Ky.	19.0	20.0	5.0	14.5
Covington	19.0	21.0	5.0	14.5
Louisville	18.0	20.0	5.0	13.5
Ashland	18.0	20.0	5.0	15.0
Catlettsburg	18.0	20.0	5.0	15.0

In addition to the state tax of 4 cents on gasoline, Montgomery has city tax of 1 cent on gasoline and one-half on kerosene. Kerosene prices in Georgia include 1-cent tax. In Florida, an inspection fee of 0.125 cent; in Alabama, an inspection fee of one-half cent on kerosene and one-fourth cent on gasoline. To Pensacola, Montgomery, Birmingham and Mobile state taxes add 1-cent levy tax. To Gulfport state tax add privilege tax of 2 cents.

Effective April 2, price to dealers 2 cents under posted tank wagon price.

NEW YORK AND PART OF NEW ENGLAND DISTRICT

Standard Oil Co. (New York)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
Albany, N. Y.	15.6	17.6	2.0	15.6
New York*	14.3	16.3	2.0	14.3
Buffalo	17.8	19.8	2.0	14.8
Rochester	18.0	20.0	2.0	14.0
Syracuse	18.8	20.8	2.0	14.8
Boston, Mass.	14.5	16.5	2.0	13.5
Augusta, Me.	19.8	21.8	4.0	14.8
Manch't'r, N.H.	19.4	21.4	4.0	14.0
Burlington, Vt.	19.6	21.6	4.0	15.3

*Prices in steel barrels.

ATLANTIC COAST DISTRICT

Standard Oil Co. (New Jersey)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
Atl'tic City, N.J.	14.5	16.5	2.0	11.5
Newark	13.5	15.5	2.0	10.5
Annapolis, Md.	16.0	18.0	4.0	11.0
Baltimore	15.2	17.2	4.0	10.2
Cumberland	17.0	19.0	4.0	12.0
Wash'gton, D.C.	13.7	15.7	2.0	10.7
Danville, Va.	17.8	19.8	5.0	11.8
Norfolk	16.3	18.3	5.0	10.0
Petersburg	17.3	19.3	5.0	11.3
Roanoke	18.0	20.0	5.0	12.0
Richmond	16.7	18.7	5.0	10.7
Charles'n, W.Va.	16.5	18.5	4.0	11.5
Keyser	17.1	19.1	4.0	12.0
Parkersburg	15.2	17.2	4.0	10.2
Wheeling	16.4	18.4	4.0	11.4
Charlotte, N. C.	18.3	20.3	5.0	12.3
Hickory	18.6	20.6	5.0	12.6
Mt. Airy	18.5	20.5	5.0	12.5
Salisbury	18.5	20.5	5.0	12.5
Charleston, S.C.	17.3	19.3	6.0	10.3
Columbia	19.2	21.3	6.0	12.3

A 2-cent per gallon discount off the gasoline tank wagon price is offered to dealers.

PACIFIC COAST TERRITORY

Standard Oil Co. (California)

	Gasoline			Kero.
	Wholesale price	Retail price	Incl'ds tax of	tank wagon
Fresno	23.0	21.0	3.0	17.0
San Francisco	23.0	21.0	3.0	15.5
Los Angeles	22.5	20.5	3.0	15.5
Reno, Nev.	28.0	26.0	4.0	19.0
Portland, Ore.	24.5	22.5	4.0	16.5
Seattle, Wash.	23.5	21.5	3.0	16.5
Tacoma	23.5	21.5	3.0	16.5
Spokane	27.5	25.0	3.0	20.5
Phoenix, Ariz.	17.0	20.0	4.0	20.0

Above prices are at company's plant or depots as company does not operate stations. A 6-cent per gallon discount is given dealers and customers taking tank wagon lots except in Phoenix where the discount is 1 cent.

STANOLIND FURNACE OIL IN CHICAGO

Less than 100 gallons	9.0
100 to 349 gallons	8.0
350 gallons or more	7.5

Note—Outside Chicago furnace oil discount of 1 cent per gallon is given on deliveries of 100 to 349 gallons and 1½ cents on deliveries of 350 gallons or more.

NAPHTHA

	Tank wagon	Tank car
Oleum spirits	14.7	10.0
V. M. & P. naphtha	16.7	12.0
Cleaner's naphtha	17.0	14.9
Stanisol	17.0	15.4

Tank wagon prices f.o.b. Chicago; tank car prices f.o.b. Whiting.

TANK WAGON CHANGES

Standard Oil Co. of Louisiana reduced the gasoline tank wagon and station prices in New Orleans, La., to 10.5 and 15.5 cents October 4. On the same date the tank wagon and station prices were reduced in Memphis, Tenn., to 12 cents and 17 cents. These prices were also reduced in Chattanooga, Tenn., to 18 cents and 19 cents. On October 7 the tank wagon and station prices were reduced in New Orleans, La., to 13.5 and 14.5 cents. On the same date these prices were reduced in Little Rock, Ark., and Memphis, Tenn., to 11 cents and 16 cents each; in Knoxville, Tenn., to 17 cents and 18 cents, and in Nashville, Tenn., to 16 cents and 17 cents.

Standard Oil Co. of New Jersey reduced the kerosene price in Norfolk, Va., to 10 cents October 8.

SEEKS KETTLEMAN UNIT PLAN

WASHINGTON, D. C., Oct. 13.—Dr. George Otis Smith, director of the geological survey, has left to attend a conference of oil and gas operators from the Kettleman Hills Field in San Francisco in the interest of concluding agreements for putting the unit plan of operation into effect in California.—C. E. K.

FORMS NEW COMPANY

William Walker, associated with General Petroleum Corp. of California for 17 years, retiring as vice president and a director of this corporation in 1927, announces the organization of Tideland Oil Co., Ltd., of which company he is the president. The company will engage in the development of various properties in proven oil areas. Offices of the company are located in the Subway Terminal Building, Los Angeles, Calif.

CRUDE OIL PRICES

(Continued from Page 133)

Lance Creek	1.63
Poison Spider (March 14, 1927)	1.00
Notches (March 14, 1927)	.65
Rex Lake (February 22)	1.10
Osage	1.63
Lost Soldier (contract, May 22)	1.00
Hamilton Dome (March 14, 1927)	.85
Greybull (April 11, 1930)	1.55
Four Bear (May 31, 1929)	.85
Cat Creek	1.55
Pondera (Montana) (April 10, 1930)	1.55
Sunburst (Montana) (Feb. 15, 1930)	1.65
Hogback (Feb. 15, 1930)	1.40
Artesia (New Mexico)	1.05
Lea County	See gravity table

Note—Salt Creek, Osage, Cat Creek, Greybull and Hogback posted by Midwest Refining Co., and the remainder by the Ohio Oil Co. Both companies posted Grass Creek light and Elk Basin.

SOUTH CENTRAL AND SOUTHWEST TEXAS

Darst Creek (April 10, 1930)*	$1.15
Luling (April 10, 1930)	.85
Mirando (April 10, 1930)†	.85
Pettus (Aug. 21, 1930)‖	1.15
Salt Flat (April 10, 1930)‖	1.15
Thrall‡	
Lytton Springs (Lockhart)	See gravity table
Somerset (April 10, 1930):	
Below 33 gravity	$1.15
33 to 33.9 gravity	1.17
34 to 34.9 gravity	1.19
35 to 35.9 gravity	1.21
36 to 36.9 gravity	1.23
37 to 37.9 gravity	1.25
38 gravity and above	1.27

*Posted by Humble Oil & Refining Co. and Magnolia Petroleum Co. †Magnolia Petroleum Co., Humble Oil & Refining Co., Crown Central Pipe Line Co. ‡Thrall prices same as North Central Texas less 19½ cents per cwt. freight. ‖Humble Oil & Refining Co.

EASTERN STATES

Joseph Seep Purchasing Agency

(Effective August 22, 1930)

Seep Purchasing Agency withdrew from Bradford and Allegany Fields as a purchaser on May 16.

Penna Grade Oil in National Transit Lines (Pennsylvania)	$2.20
Penna Grade Oil in Southwest Pennsylvania Lines (Pennsylvania)	2.25
Penna Grade Oil in Eureka Pipe Line Lines (West Virginia)	2.15
Penna Grade Oil in Buckeye Pipe Line Lines (Ohio) (Sept. 14, 1930)	1.90
Corning Grade Oil in Buckeye Pipe Line Co.'s Lines (Aug. 1, 1930)	1.50
Somerset Oil in Eureka Pipe Line Lines (Kentucky) (August 1, 1930)	1.14
Ragland Grade Oil in Cumberland Pipe Lines (Kentucky) (August 1, 1930)	1.30
Wayne District Oil in Cumberland Pipe Lines (April 11, 1930)	1.34

Tide Water Pipe Co.

Bradford district (Aug. 22)	$2.50
Allegany district (Aug. 22)	2.50

Pure Oil Co.

Cabin Creek, W. Va. (Aug. 22)	$2.40
Kelly Creek, W. Va. (Aug. 22)	2.25
Bradford Hollow, W. Va. (Aug. 22)	2.25

MIDDLE WESTERN STATES

Ohio Oil Co.

(Effective April 11, 1930)

Lima (June 26, 1930)	$1.50
Wooster (June 26, 1930)	1.70
Illinois	1.65
Indiana (June 26, 1930)	1.32
Princeton	1.65
Plymouth	1.23
Western Kentucky	1.55
Midland, Mich.* (Aug. 21)	1.30
Dundee, Mich. (April 16)‖	
....Same as Mid-Continent gravity scale	
Upper and Lower Traverse Sands, Mich. (April 16)‖	
....Same as Mid-Continent gravity scale	
Cumberland, Clay, Barren, Clinton and Monroe Counties, Kentucky (March 15)‡	1.50
Oil City, Ky. (July 25, 1930)‖	1.35
Oil Springs (Canada) (June 28, 1930)¶	2.02
Petrolia (Canada) (June 23, 1930)¶	1.95

*Posted by Pure Oil Co. †Posted by Sun Oil Co. ‡Posted by Paragon Development Co. ‖Posted by Stoll Oil Refining Co. ¶Posted by Imperial Oil Co., Ltd. ‖Posted by Standard of Indiana for boat shipment. Local refiners posted Mid-Continent prices on April 11.

MEXICAN CRUDE

Panuco*	$0.55

*F.o.b. ship, based on August transactions.

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When mighty, armored fishes swam over PENNSYLVANIA

Sensational, startling, striking . . . of course this picture stops you! And this same picture will appear 21,000,000 times... in newspapers, rotogravures and magazines the nation over . . . in a smashing, sales building advertising campaign telling why Sinclair Mobiline is the finest Pennsylvania grade motor oil!

Sinclair Mobiline is refined 100% from Bradford-Allegany crude. This crude was deposited in the Pennsylvania field during the Devonian Age when the earth was more favorable to the forming of crude for lubricating oil. Bradford-Allegany oil is the costliest of all Pennsylvania grade crudes.

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Made in the newest, largest single refinery using PENNSYLVANIA grade crude exclusively.

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35¢ *per quart*

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Creole Corporation Capital Increase

To Be Used in Furthering Development of Company's Venezuelan Concessions. Stockholders Vote November 7

Creole Petroleum Corp., Venezuelan subsidiary of the Standard Oil Co. (New Jersey), will increase its capital from 6,000,000 to 7,000,000 shares to provide additional capital for further expansion. Stockholders will meet to vote on the proposed increase November 7. Shareholders will be offered the new stock at $4.25 per share, Standard Oil Co. (New Jersey) having agreed to take any stock which the present holders do not purchase.

Announcing the special meeting, E. J. Sadler, president of Creole Petroleum Corp., said: "At this meeting the stockholders will consider and take action on the resolution passed by your board of directors, declaring it advisable to increase the authorized common stock of the company from 6,000,000 shares without nominal or par value to 7,000,000 shares without nominal or par value.

"The additional funds to be provided by the sale of the new shares will be used in furthering the development of the company's Venezuelan concessions. Our average production in western Venezuela in the first nine months of 1930 has been 15,500 bbls. daily. During the same period additional wells have been completed in eastern Venezuela, pipe lines and loading facilities have been provided and several cargoes of crude shipped. It is our belief that the proven area in this field covers approximately 3,500 acres rather than 1,000 acres as estimated in the last annual report.

"While the stockholders have no preemptive right to participate in the offering of additional stock, your directors have authorized the issuance of subscription warrants in this instance. Stockholders of record at the close of business November 21 will be entitled to subscribe for one additional share of the new stock for each six shares held at $4.25 per share.

"If the stockholders authorize the proposed increase of shares, warrants evidencing the right to subscribe will be mailed to all stockholders entitled thereto at the close of business November 21, or as promptly thereafter as possible, with complete instructions and information concerning the making of subscriptions. The subscription warrants will become invalid at the close of business December 29."

Barnsdall Corp.

Net earnings of Barnsdall Corp. after all charges including Federal taxes for the eight months ended August 31, 1930, were sufficient to cover the full year's dividend requirements of $2 a share. In the first six months of the current year the company reported net income after Federal taxes of $3,367,440 equivalent to $1.49 a share on 2,254,725 outstanding shares of combined Class A and B stock, which compares with net income of $4,115,253 after all charges in the first six months of 1929, equivalent to $1.83 a share on 2,247,245 shares. For the nine months ended September 30, 1929, the company reported net income of $5,721,706 equivalent to $2.53 a share on 2,256,747 shares of stock.

Richfield Oil

Richfield Oil Co. of California has omitted the quarterly dividend of 50 cents on the common due at this time.

James A. Talbot, chairman, following the meeting, stated: "In the interest of conservation and in light of present business conditions, the board of directors omitted the dividend on the common stock. This will permit building up of cash reserves and is in line with policy adopted by a number of other large companies throughout the country."

For the six months ended June 30, the company reported consolidated net profit of $360,608 after all deductions, equivalent to less than 1 cent a share on the 2,060,242 shares of $25 par common stock then outstanding, after preferred dividends.

In this period the California company earned $6,042,963 before depletion, depreciation, intangible drilling expense, abandonments, interest and Federal income tax, with final net after all charges $1,270,289. In the same period Richfield Oil Corp. of New York sustained net loss of $909,680 after charging to expense more than $800,000 of nonrecurring introductory expense. The consolidated net profit of the Pacific Coast and Atlantic Coast operations for the six months was thus $360,608.

In commenting on production of the company and future prospects in view of recent price changes on crude oil and gasoline, Mr. Talbot said:

"The company's production of crude oil and casinghead gasoline is being held at approximately 30,000 bls. a day in compliance with the 45 per cent curtailment program in effect throughout California. This curtailment, together with the unsatisfactory market price that has prevailed for gasoline during the period, accounts for the decreased earnings.

"In July, the market price for gasoline was restored to former levels and in August an additional increase of 1 cent a gallon was made effective by all major companies. Simultaneously a decrease averaging about 12 cents a barrel in the price they would pay for crude oil was announced by all major companies. These changes will add several hundred thousand dollars a month to the company's earnings.

"In both July and August, the New York subsidiary showed a small profit after all charges. The last six months of 1930 should show a substantial increase in earnings, as compared with the first six months, for the consolidated companies."

Twenty Representative Stocks

The Oil and Gas Journal's weekly average price of 20 representative petroleum stocks listed on the New York Stock Exchange and New York Curb, based on closing quotations for Wednesday, was as follows:

Apr. 9	53.26	July 16	46.12
Apr. 16	52.04	July 23	46.06
Apr. 23	53.39	July 30	44.89
Apr. 30	53.70	Aug. 6	45.24
May 7	50.23	Aug. 13	43.53
May 14	51.67	Aug. 20	43.79
May 21	49.71	Aug. 27	42.82
May 28	50.98	Sept. 3	42.71
June 4	50.94	Sept. 10	42.84
June 11	46.65	Sept. 17	42.43
June 18	41.41	Sept. 24	40.62
June 25	42.37	Oct. 1	37.78
July 2	44.13	Oct. 8	35.85
July 9	44.11		

Standard of Ohio

Standard Oil Co. of Ohio has called a special meeting of stockholders for October 13 to vote on the issuance of $12,000,000 5 per cent cumulative preferred stock. Public offering of the issue will be made by Chase Securities Corp. of New York within the next few days. Stockholders of Standard Oil of Ohio will have no rights on the new issue. Present 7 per cent preferred issue, of which there is $7,000,000 outstanding, will be called for redemption on January 15. The new issue, which will be $100 par, will be callable at $107.50.

Consolidated Royalty

Stockholders of Consolidated Royalty Oil Co. have approved plan for acquisition of controlling interest in Western Exploration Co. through exchange of 2½ shares of Western Exploration for one share of Consolidated. Offer is being submitted to Western Exploration stock-

(Continued on Page 143)

INDEPENDENT OILS ON NEW YORK CURB

Quotations Compiled by Francis, Bro. & Co., Associate Members of New York Curb, Kennedy Building, Tulsa, Okla.

1930 High	1930 Low	Week ended October 8 Sales	High	Low	Close	Stocks		Outstanding capital	Par value	Div. rate	Last paid	1927 High	1927 Low	1928 High	1928 Low	1929 High	1929 Low
⅝	⅛	1,000	⅛	⅛	⅛	American Consolidated Oilfields		$11,018,000	$5	....	.....	2⅛	.55	1½	.53	72c	⅛
4½	1½	800	1½	1½	1½	American Maracaibo	(sh)	700,000	N.P.	....	.....	7½	2¾	9½	3⅛	8⅝	1⅛
1⅜	1	300	1⅛	1⅛	1⅛	Argo Oil	(sh)	683,971	$10	....	.....	2¾	1	4½	2¼	5	1½
21	17	100	17	17	17	British American		1,311,321	N.P.	25cQ*	7- 2-30	40	20½	55	32¾	62	7⅞
2¾	¾	300	1¼	1⅛	1⅛	Caribbean Syndicate		$131,250	25c	....	.....	28¼	15½	4½	3⅞	4⅞	1
44¼	24⅛	29,800	26½	25½	26	Cities Service	(sh)	24,290,359	N.P.	30cA†	9- 1-30	58¾	40½	90⅞	54	68⅛	20
93⅞	88	400	91½	91½	91½	Cities Service pfd.	(sh)	1,500,000	N.P.	50cM	9- 1-30	95⅜	87	103½	94½	98¾	84
¾	⅛	500	3/16	3/16	3/16	Colombia Syndicate		$2,000,000	$1	....	.....	3⅞	1⅛	3¼	.76	2	½
5⅞	3¼	200	3¼	3¼	3¼	Consolidated Royal		$5,000,000	$10	12½cQ	7-25-30	9¾	6⅜	8⅞	6¼	11⅛	2½
7⅝	4½	5,000	5	4¾	4¾	Creole Petroleum	(sh)	5,977,873	N.P.	....	.....	14⅞	9½	17½	9½	11¾	5⅝
1	¼	200	¼	¼	¼	Crown Central	(sh)	587,000	N.P.	....	.....	3	.50	3¼	.76	2½	¼
21¾	6½	1,200	8¼	6⅛	7½	Darby Petroleum (new)		1,019,392	N.P.	50cQ	7-15-30	12	4	33½	3¼	26	6½
11	4½	200	5¾	5½	5½	Derby Oil & Refining	(sh)	500,000	N.P.	....	.....	2½	74	2¼	1	11	2
60	30	25	50	50	50	Derby Oil & Refining pfd.		48,500	N.P.	....	.....	16¾	4	21⅛	7½	44	20¾
166⅞	93¾	1,500	95½	93¾	93¾	Gulf Oil Corp.	(sh)	4,504,921	$25	37½cQ	7- 1-30	118	86¼	165	101⅛	209	115
1¾	½	500	½	½	½	Intercontinental Petroleum (new)		$5,682.000	$5	....	.....	2½	.80	3⅜	1	2⅞	⅜
3	1⅛	1,100	1½	1⅛	1⅛	Kirby Petroleum	(sh)	750,000	N.P.	....	.....	2¼	1⅛	3	1¼	3⅝	1¼
4¾	1	400	1	1	1	Leonard Oil & Development		$50,000,000	$25	....	.....	10⅞	5⅛	9⅜	5⅛	6⅛	1
29	10	1,700	12	11	11	Lion Oil & Refining	(sh)	250,000	N.P.	50cQ	7-28-30	27½	20	43⅞	20	38⅞	18
55⅞	30⅛	800	32½	31½	31½	Lone Star Gas (new)	(sh)	5,000,000	N.P.	25cQ	6-30-30	59⅜	37	69⅛	48½	67⅞	28
½	⅛	900	⅛	⅛	⅛	Magdalena Syndicate	(sh)	850,000	$1	....	.....	2⅞	.80	1⅞	.50	1¼	¼
16	6	100	6	6	6	Margay Oils		160,000	N.P.	....	7-10-30	52	12	48½	32	38½	14
7½	2	700	2½	2½	2½	Mexico-Ohio Oil		.....	...	....	.....	12⅛	5	8	2¾	6⅜	2½
¾	⅜	1,400	½	7/16	½	Mountain & Gulf		$4,000,000	$1	40cQ	7-15-30	1½	1	1¾	.76	1½	¼
12⅛	1	900	7⅜	7	7⅜	Mountain Producers		$1,682,182	$10	40cQ	7- 1-30	29¼	22¾	28⅞	19½	22⅞	7
3½	2	300	2	2	2	New Bradford Oil		$1,095,291	$5	12½cQ	7-15-30	5⅞	4⅝	5⅝	4¼	5	2½
7¼	2¾	500	2¾	2¾	2¾	New Mexico and Arizona		$1,000,000	$1	....	.....	16	9¼	11⅞	7⅛	9⅜	2¼
11¼	4⅝	100	4⅝	4⅝	4⅝	North Central Texas	(sh)	400.000	N.P.	15cQ	9- 2-30	12¾	9½	14¼	8½	18½	6⅛
2½	¼	1,100	⅜	7/16	⅜	Pandem	(sh)	489.875	N.P.	....	.....	9⅜	3¼	6	2⅛	3½	½
4⅜	1⅝	500	2	2	2	Pantapec Oil	(sh)	1,506.000	N.P.	....	.....	12⅛	7	15⅝	8½	10½	1⅞
..	..	No sales.				Pennok Oil		150.000	N.P.	....	.....	12½	5⅛	7¾	4⅛	7¾	4⅜
10½	8	400	8	8	8	Red Bank Oil	(sh)	250.000	N.P.	....	.....	24⅜	7	18	4⅞	16	9⅝
5⅜	2	100	2⅜	2⅜	2⅜	Reiter-Foster	(sh)	388.584	N.P.	....	12- 2-29	15½	3½	12⅞	4⅛	8½	1⅛
8⅝	2½	400	3	2⅝	2⅝	Ryan Consolidated	(sh)	500.000	N.P.	....	.....	7	4½	12	4⅛	11	3
2½	1⅜	200	1¾	1¾	1¾	Salt Creek Consolidated	(sh)	1,286.300	$10	10cQ	7- 1-30	8	5¼	7¼	5½	5⅞	1⅞
15¼	8	800	9¼	9	9	Salt Creek Producers	(sh)	1,496.859	$10	50cQ	8- 1-30	35½	27¼	35	23⅛	25⅞	9
1	½	100	½	½	½	Savoy Oil		$750.000	$5	....	.....	7	1¼	3½	1	2½	7/8
4½	1¾	200	1¾	1¾	1¾	Venezuelan Petroleum	(sh)	755.090	$5	5cQ	2-15-30	7⅜	4¼	9⅛	4¾	6½	1¾
5	2	300	4	4	4	Woodley Petroleum		$500.000	$1	15cQ	3-31-29	7	4¾	8¼	4⅞	9½	2
2½	½	100	⅞	⅞	⅞	Y Oil & Gas		100,000	N.P.	....	.....	6	1¾	8⅜	2⅛	2⅞	¼

*Including one-half per cent monthly in stock. †Payable monthly and a monthly stock dividend of one-half per cent. x Ex-dividend.

STANDARD OIL STOCKS ON NEW YORK CURB

Quotations Compiled by Francis, Bro. & Co., Associate Members of New York Curb, Kennedy Building, Tulsa, Okla.

1930 High	1930 Low	Week ended October 8 Sales	High	Low	Close	Stocks—	Outstanding capital	Par value	Div. rate	Last paid	1927 High	1927 Low	1928 High	1928 Low	1929 High	1929 Low
18½	12¼	400	18½	18⅜	18½	Anglo-American Oil (vot. C.O.D.)	£4,192,635	£1	.36⅓	.....	21⅝	17⅛	22⅜	14⅞	17	11
1	⅜	400	⅜	⅜	⅜	Atlantic Lobos	.....	...	....	.....	..	..	..	..	..	..
25	14	50	16	16	16	Borne Scrymser	$1,000,000	$25	$1SA	10-15-29	59	50	56½	44½	46½	25
69	53	100	53	53	53	Buckeye Pipe Line	$10,000,000	$50	$1Q	12-14-29	60	45	76	53	74½	55
184⅞	120¼	600	130	120¼	130	Chesebrough Mfg.	$3,000,000	$25	$1Q*	7-30-30	126	76½	161	117	210	130
65⅜	30½	100	33	33	33	Cumberland Pipe Line	$1,500,000	$50	$1Q	9-15-30	137	89	114	67	75¾	40
54¾	35	100	35	35	35	Eureka Pipe Line	$5,000,000	$100	$1Q	8- 1-30	68½	47	88	64½	70½	42
7	2½	400	4⅛	4	4⅛	Galena Signal Oil	$16,000,000	$100	....	.....	13½	3½	13	4¼	6½	3
119	75¾	400	77⅞	77⅞	77⅞	Humble Oil & Refining	$74,103,300	$25	50cQ	7- 1-30	68½	54	114¾	59¼	128	74⅛
320	303	100	320	315	315	Illinois Pipe Line	$20,000,000	$100	$10SA	9-15-30	182	123¾	290½	176½	340½	260
30	18	3,600	19¼	18¼	18⅝	Imperial Oil of Canada (new) (sh)	26,421,768	N.P.	12½cQ	9- 2-30	64¾	37¾	104	56¾	41	22
41	30	100	31	31	31	Indiana Pipe Line	$3,000,000	$10	50cQ‡	8-15-30	94½	61	91⅞	74⅜	41⅞	26
24	15⅛	7,300	16	15⅛	15⅛	International Petroleum (sh)	14,247,088	N.P.	12½cQ	6-16-30	29	28¼	55	35	30⅜	15
22⅜	15⅛	200	15¼	15¼	15¼	National Transit	$6,362,500	$12.50	25cQ‡	9-15-30	24	13½	32⅜	19⅜	25⅛	10⅛
21⅜	10⅛	100	12⅞	12⅞	12⅞	New York Transit	$1,000.000	$10	40cQ†	4-15-30	44½	31¼	75	38½	17½	10
54	30⅛	100	30⅛	30⅛	30⅛	Northern Pipe Line	$2,000.000	$50	....	7- 1-30	100	70	69	56½	63	41
32	17	9,900	20⅛	20	20	Penn Mex Fuel	$10,000,000	$25	50cQ	8-22-30	39	12	84	28	44½	20
33	10⅜	100	10⅞	10⅞	10⅞	Solar Refining	$4,000,000	$25	$1.25SA	6-30-30	..	..	..	..	50	29
20⅞	10	200	11⅞	10	11⅞	Southern Pipe Line	$1,000,000	$10	5cQ	6- 2-30	27¼	15½	19	15	22½	13
45⅞	25	100	31⅞	31⅞	31⅞	South Penn Oil (new)	$30,000,000	$25	50cQ	6-30-30	41½	35	71⅞	36¾	60¼	35⅛
65	35	100	45¼	45¼	45¼	Southwest Pennsylvania Pipe Lines	$1,750.000	$50	$1Q	1-10-29	83	55½	102	70	70	60
59⅞	43⅝	4,200	44¾	44⅛	44¼	Standard Oil of Indiana	$348,175,069	$25	62½cQ‡	9-15-30	81½	64⅜	95⅞	70⅞	63	45
40½	26⅛	1,200	27⅞	27⅛	27¾	Standard Oil of Kentucky	$25,654,516	$10	40cQ	6-30-30	130	111½	179¾	122¼	46⅞	29
48⅞	44⅛	100	45⅜	45⅜	45⅜	Standard Oil of Nebraska	$4,649,225	$25	62½cQ‡	9-20-30	49½	40	54⅞	39⅞	50¼	40
108½	64	100	64⅞	64	64	Standard Oil of Ohio	$14,000,000	$25	62½cQ	7- 1-30	87½	72	134	71	129	60
10	5	100	5	5	5	Swan-Finch Co.	$861,466	$25	.43¾cQ	9- 3-30	21	14½	23½	16	18	10
97⅞	66⅛	2,400	71½	69¼	69¼	Vacuum Oil Co.	$126,180,350	$25	$1Q	9-20-30	..	..	111	72	133¾	75

*Plus 50 cents extra. †Plus 10 cents extra. ‡Plus 25 cents extra. x Ex-dividend.

TRANSACTIONS IN OIL SHARES ON NEW YORK STOCK EXCHANGE

Quotations Compiled by Francis, Bro. & Co., Members of the New York Stock Exchange and Associate Members of New York Curb, Kennedy Building, Tulsa, Okla.

1930 High	1930 Low	Week ended October 8 Sales	High	Low	Close	Stocks—	Outstanding capital	Par value	Div. rate	Last paid	1927 High	1927 Low	1928 High	1928 Low	1929 High	1929 Low
31½	18	1,300	24⅛	23½	23½	Amerada Corp. (sh)	922,075	N.P.	50cQ	7-31-30	37⅝	27⅝	43⅞	27⅛	42⅝	17½
37	13	400	13¼	13	13¼	American Republic Corp. (sh)	209,180	N.P.	....	.....	82½	35⅛	85	51⅛	64⅜	12½
51	32½	10	39½	39½	39½	Associated Oil	$57,260,300	$25	50cQ	9-30-30	50¼	35	53⅜	37½	47¼	34½
61¾	24⅝	3,200	27	26⅛	26⅝	Atlantic Refining	$66,763,775	$25	25cQ†	9-15-30	131⅝	104	66⅜	50	77⅞	30
34	18½	1,800	19	18½	19	Barnsdall Corp. A	$56,546,600	$25	50cQ	8- 6-30	35½	20¾	54	20	49¼	20
30½	13⅝	4,600	14¼	13⅝	14	Continental Oil of Delaware (sh)	4,741,554	N.P.	....	12-15-27	..	..	..	..	47⅛	18
71⅛	35	700	34⅞	34⅝	34⅝	General Asphalt (sh)	413,333	N.P.	$1Q	9-15-12	96¾	65	94⅞	68	94¾	42¼
116⅞	52¼	5,700	58¾	55½	56¼	Houston Oil	$24,968,600	$100	....	.....	175¾	60⅛	167	79	109	26
32	18⅜	1,100	19	18⅝	19	Independent Oil & Gas (sh)	1,362,295	N.P.	50cQ	7-31-30	32¾	17⅝	38⅜	21¾	39⅜	17¾
28⅜	6¾	3,200	8	7¾	7¾	Indian Refining	$12,565,070	$10	....	.....	12⅛	7⅝	39⅝	9	53	13⅛
29½	21¼	1,900	27⅛	27⅛	27⅛	Lago Oil & Transport (sh)	3,992,122	N.P.	....	5- 2-27	37¾	20½	39⅛	27⅜	38⅜	16½
12	7	200	7½	7⅜	7⅜	Louisiana Oil Refining (sh)	1,190,063	N.P.	....	.....	18⅛	10	19¾	9⅜	18	7
10⅜	3	200	3	3	3	Maracaibo Oil (sh)	330,000	N.P.	....	.....	22¾	12	25½	12½	18½	5⅛
37	16⅛	4,900	18⅝	17½	17⅝	Mexican Seaboard (sh)	1,244,383	N.P.	....	10- 1-24	9¼	3	72	4⅝	59⅜	8¼
33	19⅝	1,300	20	19⅞	20	Mid-Continent Petroleum (sh)	1,857,912	N.P.	50cQ	7-15-30	39⅜	25½	44½	25⅛	39⅞	22⅛
..	..	No sales.				Middle States ctfs.	$23,736,130	$10	....	7- 1-23	3¾	1⅝	7⅜	2⅜	5⅛	¾
33	22⅛	3,100	25	23⅝	23⅞	Ohio Oil (new W.I.)	$60,000,000	$25	$2Q	9-15-30	67⅞	52	84	58½	79⅞	64¼
64¼	51	100	51	51	51	Pan American P. & T.	$50,084,700	$50	....	12-20-27	65⅞	40⅛	50⅞	38¼	69	40½
67½	50½	200	51½	51½	51½	Pan American P. & T. "B"	$121,110.650	$50	....	12-20-27	66⅜	40¼	58⅞	37⅜	69¼	40½
..	..	No sales.				Pan American Western "B"	400.000	N.P.	....	1-30-27	37⅞	16¾	28⅜	15½	18½	13⅝
12¾	3⅜	500	3¾	3½	3½	Panhandle P. & R. (sh)	199,370	N.P.	....	.....	18⅞	8	21¾	11½	15¼	3
80	47½	100	70	70	70	Panhandle P. & R. pfd.	$2,564,400	$100	....	7- 2-23	83	54	108	70	76	47½
44¾	24⅝	3,400	25⅝	25	25⅛	Phillips Petroleum (sh)	2.593,075	N.P.	50cQ	6-30-30	60¼	36¼	53⅞	35¼	47	24¼
2½	⅜	500	1	1	1	Pierce Oil Corp.	$29.622.831	$25	....	.....	1⅛	½	5¼	½	3⅜	1
7⅛	2¼	1,400	3½	3½	3½	Pierce Petroleum (sh)	2.500.000	N.P.	....	.....	5½	2½	7	3½	5⅞	½
54	25	400	25¾	25¼	25¼	Prairie Oil & Gas	$60.848.000	$25	50cQ*	6-30-30	55½	45⅝	68	46	65⅝	40½
60	27⅞	18,000	31⅞	27⅞	29¾	Prairie Pipe Line	$101.250.000	$25	75cQ†	6-30-30	190	130¾	280	172	65	45
11⅞	5	300	5	5	5	Producers & Refiners	$37,438.950	$50	....	9-15-23	33⅞	16¾	29⅞	16	25⅞	4
40	25½	100	25½	25½	25½	Producers & Refiners pfd.	$2.845.350	$50	....	5- 4-25	50	36⅞	49⅝	41	46¾	25½
27¼	16¼	3,000	17⅝	17¼	17⅝	Pure Oil	$75.959.250	$25	37½cQ	9- 1-30	33½	25	31⅝	19	30¾	20
28½	7½	3,000	8⅝	8	8⅛	Richfield Oil	$52,410,875	N.P.	....	9- 1-30	28⅝	25⅜	56	23	49⅝	20
25¾	8⅝	800	10⅜	9⅝	10	Rio Grande Oil (sh)	1,236,270	N.P.	$2A	7-25-30	..	..	37½	32	42½	15
56½	43⅞	2,700	44⅞	44⅛	44¼	Royal Dutch, N. Y. (sh)	611.303	...	$1.875	8-13-30	54½	44¼	64	44⅝	64	43⅛
48⅜	37½	50	38¾	37½	37½	Shell Transport & Trading Co.	£23.985.000	£1	$1.45	7- 8-30	48⅝	40½	47⅞	41⅜	51½	40⅝
25½	11	4,100	12	11¼	11⅜	Shell Union Oil (sh)	13,066,497	N.P.	....	6-30-30	31⅜	23⅝	39¼	23¼	31⅜	19
37	14	200	14	14	14	Simms Petroleum	$8.353.620	$10	40cQ	9-15-30	25⅜	14¼	27¼	18⅛	40⅛	15
32	16	6,500	17	16½	16½	Sinclair Consolidated (sh)	5.500.000	N.P.	50cQ	7-15-30	22⅜	15	46¾	17⅜	45	21
112¼	108	100	109¾	109¾	109¾	Sinclair Consolidated pfd.	$16.025.250	$100	$2Q	7-15-30	104½	97	110	102½	111	103
42	22¼	1,200	22⅜	22¼	22¼	Skelly Oil	$27.441.250	$25	50cQ	9-15-30	37⅜	24⅛	42⅝	25	40½	28
75	54½	2,200	55⅜	54½	54½	Standard of California (sh)	12.594.098	N.P.	62½cQ	9-15-30	60¾	50⅜	80	63	81¾	51½
49	22	300	24	23⅞	23⅞	Standard of Kansas	$8.000.000	$25	50cQ	9-15-30	20⅞	14⅝	37⅜	15	33¾	18
84⅞	57⅛	22,000	60	58¾	59	Standard Oil of New Jersey	$634.999.200	$25	25cQ*	9-15-30	41⅜	35⅛	59⅜	37¾	83	49
40⅜	26¾	4,700	28⅜	27⅞	28	Standard Oil of New York	$445,223.675	$25	40cQ	9-15-30	34⅛	29¾	33¼	28¾	48⅛	31⅜
70	50	100	53	53	53	Sun Oil (sh)	1,416.869	N.P.	25cQ	9-15-30	34⅞	30	77	31½	68⅜	55
9⅜	1½	700	1⅞	1⅞	1⅞	Superior Oil Corp. (sh)	776.979	N.P.	....	12-20-20	..	..	..	..	24	5¼
60½	43⅜	6,600	45¼	44½	45	The Texas Corp.	$246.204.900	$25	75cQ	7- 1-30	58	45	74¾	50	71⅞	50
14½	6¼	300	6⅞	6⅜	6⅞	Texas Pacific Coal & Oil Co.	$9,304.890	$10	2½%A‡	12-31-29	18⅞	12	26⅝	12⅛	23⅞	9½
31	19½	200	21¼	21¼	21¼	Tide Water Oil	2.191.759	N.P.	20cQ	6-30-30	29⅛	19	41½	19⅝	40	14
94⅞	83	100	86	86	86	Tide Water 5% pfd	$19.947.000	$100	$1.25Q	9-15-30	90⅛	85	100⅛	86	97½	85⅛
17¾	10⅛	1,900	10⅞	10½	10½	Tide Water Associated (sh)	5.560.424	N.P.	30cS	8-15-30	19⅛	15¾	25	14⅜	23½	10
89¾	78	200	78	77½	77½	Tide Water Associated pfd.	$73.284.500	...	$1.50Q	7- 1-30	..	..	..	..	90⅞	74⅛
50	33⅛	800	33¾	33¼	33⅜	Union Oil of California	$104.342.375	$25	50cQ	8- 9-30	56½	39⅝	58	42⅜	57	42⅛
38½	25⅛	100	25½	25½	25½	Union Tank Car (new) (sh)	1,254.048	$100	$1.25Q	1- 2-30	127½	94	128⅛	110	163¾	121⅞
27	7¾	800	8⅛	7⅞	7⅞	Warner-Quinlan (sh)	632.948	N.P.	50cQ	7- 1-30	34½	24½	44⅞	26	42⅞	15
..	..	No sales.				White Eagle Oil & Refining (sh)	505.100	N.P.	50cQ	1-20-30	27½	20	38	20⅛	38	25
21	11	200	11¾	11¾	11¾	Wilcox Oil & Gas (sh)	428,907	N.P.	....	5-10-28	..	..	..	..	29¾	12⅞

*Plus extra dividend of 25 cents. †Plus extra dividend of 50 cents. ‡Payable in stock. x Ex-dividend.

In comparing highs and lows for the several years in the three tables, it will be necessary to take into consideration cases where there have been splits in the stock.

OIL MEN DISCUSS PROBLEMS OF INDUSTRY

(Continued from Page 62)

structure on the old method of one well to 10 acres would be in excess of $400,000,000.

"Realizing the necessity of conserving this great oil and gas deposit, the Federal Government, owner and lessor of approximately one-half of the land within this pool, is, with the operators, attempting to formulate a unit plan for its development which points the way to the only sane solution of the difficulties confronting the oil producing industry.

"Unless a unit plan is agreed to by all operators and approved by the secretary before January 31, 1931, it will be impossible to continue the practical working out of any unit plan, because before another amendment with all the delay and uncertainties attending it, could possibly be passed, the field will in all probability be out of control.

"In face of this condition it is unfortunate that public attention should be diverted from an economic problem which so essentially bears on the prosperity of the country by the recent sensational statements that vast oil reserves have been dissipated by the department of the interior. The statement has been made that through the giving away of the fee to lands in the shale deposits areas of Colorado, the Government has lost, or will lose, reserves having the value of $40,000,000,000, and the public left holding the bag.

Shale Oil A Last Resort

"The land classified as oil shale in the 1929 annual report of the director of the United States geological survey in the three states, Colorado, Utah and Wyoming, is over 4,000,000 acres, none of which is under lease. This 4,000,000 acres is subject to the Land Leasing Act of 1920, and is available for leasing. However, this report also states that no applications for lease are now pending. It occurs to me that if this land had the value above indicated it would be in greater demand than this report shows.

"The sensational charges of Mr. Kelley, when analyzed, indicate a belief on his part that the Government has been too lenient in accepting evidence of rights established under the old placer mining law by virtue of which the Government must grant patents. The secretary has stated that approximately 38,000 acres of land has been patented during his term of office. However, on account of the sensational nature of Mr. Kelley's charges, the publicity attending them is out of all proportion to their importance. The public, always ready for some spicy scandal, particularly if it is in connection with oil, is only too willing to think of a $40,000,000,000 reserve being improperly administered.

"Production of oil from oil wells, necessarily requires high-priced labor. Production of oil from oil shales must be based upon extremely low-priced labor, if not, indeed, upon Soviet methods of compulsory cheap labor. The present known deposits in the oil sands of the country will suffice our needs for many years. After the oil sands have been exhausted, the distillation of oil from the inexhaustible coal fields will be our next source of supply. In the opinion of those who have made a study of the question, shale cannot compete with coal distillate as far as we can see into the future. It is my opinion that before those oil shales can be commercially profitable, a substitute for oil products will be found for use as motor fuel.

"Unless the American wage scale is radically reduced, these shale deposits cannot possibly be exploited until such time as our oil fields and the other big oil fields of the world and probably our coal deposits will have become exhausted. I know of no oil executives interested in acquiring oil shale deposits, and in my opinion these deposits have no present commercial value whatsoever."

New Board of Officers

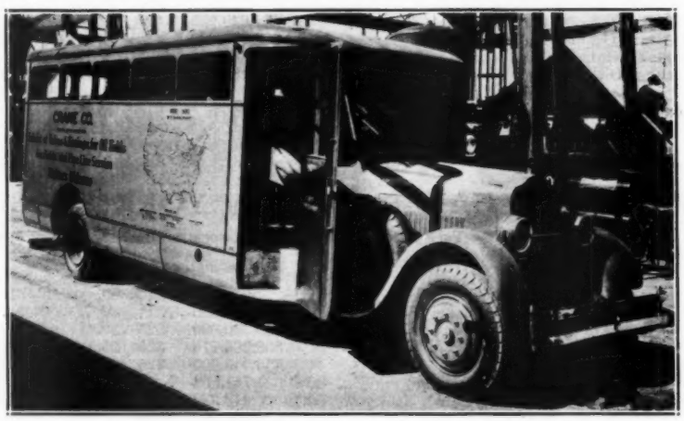
At the annual meeting of the Kansas-Oklahoma division of the Mid-Continent Oil & Gas Association held in Tulsa Wednesday, October 8, the following officers were elected for the coming year:

Alvin Richards, Pure Oil Co., president, Kansas-Oklahoma division; Rush Greenslade, Gypsy Oil Co., first vice president; T. C. Johnson, Wichita, Kan., vice president for Kansas; John H. Kane, Phillips Petroleum Corp., vice president for northern Oklahoma; Wirt Franklin, Wirt Franklin Petroleum Corp., vice president for southern Oklahoma; Harry H. Smith, secretary treasurer.

New members of the executive committee elected were: O. T. Dawson, National Supply Co.; Charles Steele, Crosbie interests; Rush Greenslade, (ex-officio), Gypsy Oil Co.; Ralph Riley, J. A. Hull Corp.; James G. Lyons, Okmulgee, Okla.; F. O. Prior, Dixie Oil Co.; E. E. Kirkpatrick, Tom Slick Oil Co.; R. S. Ellison, Stanolind Crude Oil Purchasing Co.; H. B. Fell, Simpson-Fell Oil Co.; C. W. Tomlinson, Schermerhorn Co.; B. A. LaSalle, Ada, Okla.; W. H. Gant, Ardmore, Okla.; Jake L. Hamon, Jr., Ardmore, Okla.; Ward Merrick, Ardmore, Okla.; Ralph S. Pringle, Tidal Oil Co., and E. H. Leroux, Oklahoma Pipe Line Co.

EXHIBIT ON WHEELS TO TOUR OIL FIELDS AND DISTRIBUTION CENTERS

A unique method of displaying and explaining its new products to the petroleum industry has been developed by Crane Co. of Chicago, manufacturers of valves and fittings for use by the oil and natural gas industry. A large inclosed 10-ton truck, carrying new and improved products manufactured by the company, is starting this week to make a tour of the oil fields and oil field distribution centers in Kansas as the first part of an itinerary which will take the truck south through Oklahoma and Texas and west through New Mexico, Colorado and other oil and gas producing states and through California.



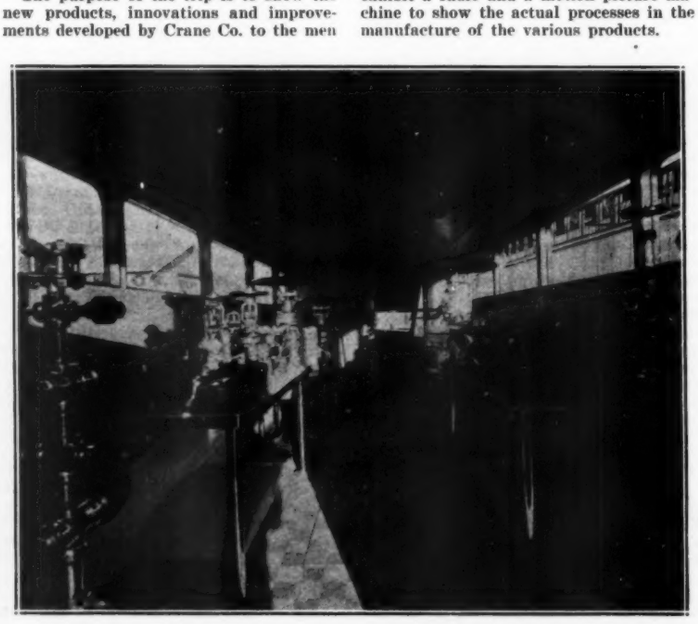
Truck which is touring oil centers showing new products for the petroleum industry.

W. Howard Pape of Tulsa, oil engineer for the company, will be in charge of the truck and will have with him on the trip C. A. Dopp, product design engineer, and Thomas R. Reynolds, sales representative.

The purpose of the trip is to show the new products, innovations and improvements developed by Crane Co. to the men interested in equipment used in the producing, refining, transportation and natural gas divisions of the petroleum industry. Representatives of distributors of Crane products will meet the truck and accompany it through their respective territories and it is hoped by the company that all men interested in this equipment in the fields and distribution centers will have an opportunity of visiting the truck and viewing the exhibit of equipment, valves, fittings, etc., it carries.

The truck itself is a credit to engineering skill. On first tests a maximum speed of 18 miles an hour was all that could be obtained. This problem was solved as was that of constructing the vehicle to carry safely the 9,000 pounds of valves and fittings to be displayed. Special brakes were developed to permit quick stops from maximum speed.

The truck will carry in addition to the exhibit a radio and a motion picture machine to show the actual processes in the manufacture of the various products.



Interior view of Crane Co. exhibit truck.

NARROWER MARKET SPREADS IN FUTURE

(Continued from Page 34)

ing a gallon of gasoline in many cases has exceeded the amount received by the producer and refiner for the gasoline fraction of the crude oil.

During 1929, these margins were maintained at many points with little complaint regarding price cutting and other attendant evils. But this year, the distributors selling under the general price levels, particularly in the case of gasoline have gained in numbers and business per station.

Changed Conditions

In this connection, one Mid-Continent refinery executive says two conditions are responsible for the change this year. He points out that in 1928 and 1929 the buying public was more impressed with quality than it is at the present time. Starting in 1927, a few large companies through advertising and aggressive sales campaigns stressed the superior quality of their products. Ethyl Gasoline selling at premium prices was favorably received by consumers throughout the entire country. Refining companies improved the quality of their lubricating oils and increased the service station price from 25 to 30 or more cents per quart.

The success of the first companies to adopt this plan of emphasizing premium products was outstanding and other concerns quickly adopted it. What was the exception became the rule and as explained by the refinery executive previously mentioned, the matter of quality lost its importance with many consumers who are having the superior products offered them by practically all distributors. Quality lost sales prestige when it became common.

The other development had to do with the depressed financial condition which had made the consumer of petroleum products more price conscious than he was in more prosperous times. This is not peculiar to the oil industry but has been true in the merchandizing of practically all commodities, the seller seeking to stimulate business by offering bargains.

This does not mean that the volume of premium gasoline business has decreased. In the case of Ethyl Gasoline, total sales are constantly mounting but with all but a half dozen of the major marketing companies now selling the products, the volume has been split up so that it is not as important a factor in the sales of individual companies as it was a year and two years ago. The same situation applies to the premium grades of motor oils.

The "price cutter" has regained prestige with the consumer regardless of his position within the oil industry. Operating direct "from the tank car to the consumer" with a much smaller investment in station facilities, eliminating expensive services to the motorists with a large volume he had no trouble underselling his large competitor 2 or more cents a gallon in the case of gasoline with similar reductions in other products.

Aside from the independent jobber operating on a price-cutting basis, the wide margins have complicated the dealer accounts of the larger marketing concessions. In the operation of lease and agency agreements, they have brought special inducements from the seller and the dealers in many cases have passed on these to the retail trade through secret rebating, commercial discounts and the hundred and one methods of price cutting commonly known in marketing circles.

One executive who has taken a prominent part in bringing about the adoption of the Code of Ethics governing the marketing of refined products states that these margins and the evils they have brought about are the main stumbling block in securing the general acceptance of the code.

Reducing Costs

Appreciating this situation, the heads of many marketing organizations have considered all of the suggested remedies and now apparently many of them have decided that selling additional commodities and services at stations, thus reducing the investment and operating costs chargeable to petroleum products, will enable them to operate at lower costs which can be passed on to the consumer and will weaken the position of competitors who have sold at cut prices.

A majority of the executives and sales managers who have expressed their views regarding the latest trend in petroleum merchandizing believe that it is sound. A contrary view came from some who have made a study of the developments from the standpoint of their own operations and the entire industry. One executive, although agreeing that present conditions had been unsatisfactory for some time, said the marketing branch "was getting nowhere fast" and was simply adding to its troubles by expanding its merchandizing operations into new fields. The solution he offers is fewer stations with a greater volume of business per unit which will enable the companies to reduce the margins now needed to carry on station operations. Others who are skeptical of the success of the plan, if generally adopted, point to the mass of detail which will have to be handled in the sale of tires, automobile accessories, telegrams, etc. Coupled with this is the training and handling of an enlarged personnel with the prediction that "present problems will be simple in comparison to those which will develop later with every station a miniature department store."

Companies which have completed plans for expanding their station operations and those who expect to within the next few months believe that the departure will in time prove a solution to the ills of the marketing branch of the oil industry.

"The oil industry has been slow in waking up to its opportunities," was one station manager's summary of the situation, "we have been wrong in assuming that a station operated by an oil company or dealer should confine its services to the car owner to petroleum products." The drive-in service station in the opinion of this manager is the logical place to give the motor vehicle complete service with the exception of car repair. This includes not only tires and small automobile accessories, batteries, but brake testing and other services not requiring the employment of skilled mechanics.

The proponents of the plan point out that the oil marketing companies already have the locations to conveniently serve the car owner with more units than all their competitors combined. The modern drive-in station already has many of the facilities required for complete service. This includes covered greasing racks which can be enlarged to provide for tire, battery and brake services. Compressed air and rest rooms are pointed to as facilities already available at stations which can readily be tied in with enlarged operations.

Other Views

Some oil marketers feel that the expansion should not stop with complete service to the motor car but include other services and commodities. The fact that the average owner uses his car in the purchase of drinks and foodstuffs and many other products used in his home is the basis for this viewpoint. It is contended that the whole trend in merchandizing centers around conveniences for the car owner. Many marketers believe it is feasible to provide parking space and consolidate oil and tire sales with facilities for merchandizing anything which can be conveniently transported in the car.

The obvious aim of all these plans, as previously explained, is to lower merchandizing costs in the sale of petroleum products. It is this angle and its probable effect on tank car prices that interests many refiners, particularly those located in the Mid-Continent Field.

Mid-Continent Situation

In the latter area, there are a number of refiners who do not operate company-owned filling stations and who sell their gasoline output from week to week on the so-called "spot" market or through contracts with jobbers. Most of the larger refiners do not dispose of all their gasoline production through their own facilities and they are also dependent on the spot market and long-time contracts with jobbers in the sale of part of their plant output.

These refiners are now wondering if the recent narrowing of the spread between the refinery gasoline and tank wagon prices by the major distributors due to competitive conditions will not be adopted as a permanent policy. The fact that several of these companies have taken the lead in the movement to expand station operations lends credence to this view.

This is of direct concern to refiners with the long-time contracts. Usually these contracts are based on published spot quotations with the refiner guaranteeing the jobber a minimum margin under the gasoline tank wagon or service station prices. The most familiar type is that between Mid-Continent refiners and middle western jobbers. Due to the wide spreads that have been maintained between spot tank car and the service station prices, jobbers have demanded and obtained wider and wider minimum guarantees. These guarantees at present generally vary from 5 to 6 cents under the service station price with a few cases in which the guarantee is in excess of 6 cents.

Should there be a return to the spreads between tank car and tank wagon prices in effect a few years ago, it is apparent that these contracts would lose their attractiveness from the standpoint of the seller. He would be placed in the position of assuring a jobber a margin which was out of line with the basis on which the major marketing companies were operating and also out of line with prevailing spot market.

MANY SUBJECTS COVERED BY PAPERS AT OIL SHOW MEETING OF A.S.M.E.

By L. G. E. Bignell
Petroleum Engineering Editor

Papers presented at the first national meeting of the Petroleum Division, American Society of Mechanical Engineers, held in connection with the International Petroleum Exposition, Tulsa, last week dealt with many phases of the oil industry and place at the disposal of engineers and others much valuable information. These papers, prepared by recognized authorities in their various lines, were in many cases presented in nontechnical language designed to make them readily understandable to the general reader.

Walter Samans, chief engineer of the Atlantic Refining Co., gave a comprehensive review of "The Petroleum Industry" and pointed out the progress that has been made in the past 50 years in petroleum mechanical engineering. Mr. Samans has been a close student of mechanical problems of the industry for many years.

Diesel engines are rapidly finding their place in this industry and papers on the subject were placed before the meetings by E. H. Hillman of the technical division of the Standard Oil Co. (Indiana) and J. B. Harshman of the Sinclair Pipe Line Co. and John M. McGregor of the Byron Jackson Co., Tulsa.

Oscar Wolf, assistant chief engineer of the Texas Pipe Line Co., Houston, Tex., presented a paper on "Economic Design of Oil Pipe Line Transportation Systems" that is likely to be kept by engineers interested in this phase of the industry for ready reference.

Pipe Line Station Attracts Many

The A.S.M.E. special research committee installed at the exposition grounds an automatic pipe line station that attracted thousands of visitors. Features incorporated in its design permitted the performance of every duty required to handle oil from the lease tanks to the refinery storage tanks. It was fully described in a joint paper presented by James B. Ford, J. B. McMahon and T. D. Williamson, and indicates the trend of development made possible by the contributions of the electrical and mechanical engineers.

Pipe line problems were further treated in two excellent papers by Fritz Karge, engineer of transportation for the Union Oil Co. of California, Los Angeles, and a joint paper by Bert Martin and William G. Heltzel, engineers with the Sinclair Pipe Line Co., Tulsa.

Leslie W. Vollmer and Blaine B. Wescott of the research department of the Gulf Cos., Pittsburgh, Pa., contributed data upon "Effect of Hydrogen Sulphide on Wire Rope." This paper outlined the reactions that take place in wire lines subjected to hydrogen sulphide gas in the presence of moisture and brine in wells and explained the reasons these reactions are so rapid and destructive to drilling cables.

Refinery Problems Discussed

Several papers were presented covering refinery problems. John Primrose, vice president of Foster Wheeler Corp., New York, read a paper on "Construction and Operation of Tube Stills for High Pressures and Temperatures," and Lyman C. Huff of the Universal Oil Products Co., Chicago, presented one on "Importance of Cracking Equipment in the Modern Refinery." J. R. Darnell, sales engineer with B. F. Sturtevant Co., Chicago, had a paper on "Improving Combustion Efficiency in Oil-Still Operation." "Gasoline Recovery and Fractionation in the Refinery" was discussed by G. M. Jackson, president of Jackson Engineering Corp., Tulsa.

Pumping oil was handled in two papers. W. H. Stueve, with the Oklahoma Gas & Electric Co., Oklahoma City, dealt with "Some Operating Data for Electric-Motor-Driven Reciprocating and Centrifugal Oil Pipe Line Pumps," and Fred B. Applegate, manager of the direct-acting pump and feed water heater division of the Worthington Pump & Machinery Corp., Harrison, N. J., discussed "Reciprocating Hot-Oil Pumps."

Absorption and Stabilization

"Absorption and Stabilization—Their Technical and Economic Position in the Oil Industry," by L. S. Gregory, with Black, Sivalls & Bryson, Tulsa, described factors that influence the operation of an absorber and stabilizer in the natural gasoline industry and their uses in the refinery.

R. L. Duff, chief metallurgist of the Standard Oil Development Co., Elizabeth, N. J., presented a paper on "Alloy Steels for Industrial Purposes." The concluding paper in the three-day program was one covering the application of the Cotrell process of electrical precipitation to the recovery of sulphuric acid in connection with sludge-acid concentration and recovery processes. This was prepared by P. E. Landolt, eastern manager of the Western Precipitation Co., New York.

William G. Heltzel, national chairman of the Petroleum Division of the A.S.M.E., was active in arranging the details of this program, assisted by members of the society residing in the Mid-Continent area and New York. Much of the detail work was handled by Ernest Hartford, assistant secretary of the A.S.M.E., New York, who has spent a large part of his time in the oil country during the past year in the interest of the petroleum division.

ORDERS FOR EQUIPMENT RESULT OF OIL SHOW

(Continued from Page 31)

signed contracts for space at the next show while many others had expressed their intention of doing so. The need for prompt action in this matter of engaging exhibition space well in advance was shown this year in the mad rush for space at the last moment by manufacturers and others who had procrastinated. The management was able to give some of these outdoor space, but many had to be turned away.

The gratifying results attending the installation this year of a refiners and marketers building, devoted entirely to exhibits from these branches of the oil industry, are an earnest of the still greater part which these divisions will play in future shows. Although no definite plans have been laid, it is understood that the refiners and marketers in the future will occupy an even larger place than they did this year.

The pronounced success of the 1930 exposition, reflecting as it did the careful planning of the management, is all the more remarkable by reason of the fact that three days of rain followed the opening, making the show practically a five-day one. On each of the five pleasant days, however, record-breaking crowds thronged the grounds. The next show will be held in May, 1932.

Foreign Representatives Pleased

Of about 100 delegates and representatives from 16 foreign countries who attended the show this year many had not seen previous expositions. They complimented the management on the arrangements for the convenience of visitors and exhibitors and the character of the buildings, drives and general appointments and they thanked the management for the courteous manner in which they had been entertained.

Safety teams of 14 oil and gas companies competed in the annual safety and first-aid contests of the safety division of the Mid-Continent Oil & Gas Association Thursday. A banquet under the auspices of the association was held Thursday evening with Omer K. Benedict, Tulsa banker and oil man, toastmaster.

The Sinclair Oil Co. team from Healdton, Okla., under the direction of J. L. Ashford, captain, won first place, according to announcement of Don J. Wallace, safety director for the association and chairman of the contests. J. A. Robinson is team judge, and the members of the team are I. C. Jones, Flave E. Space, Ambrose Nicholson, J. A. Stribling and Walter A. Nicholson.

The Sinclair team also won the annual resusitation event.

The Baytown, Tex., team of the Humble Oil & Refining Co., won second place. This team is composed of E. L. Alford, captain; H. C. Liccioni, judge; W. F. Spear, C. P. Blanchard, J. C. Kilgore, Kirby Norris and J. L. Hart.

Third place went to the Freeport Sulphur Co. team, from Freeport, Tex., Members of this team are: W. O. Smith, captain; J. C. Evans, judge; H. M. Keith, E. J. Ledet, Walter L. Barnard, Joe B. Barnard and P. M. Matukas.

Teams Participating

The following teams participated in the meet and attended the banquet: Lone Star Gas Co., Dallas, Tex.; Empire Oil & Refining Co., refining division, Ponca City; Empire Oil & Refining Co., refining division, Gainesville, Tex.; Empire Oil & Refining Co., refining division, Okmulgee, Okla.; Sinclair Oil Co., Healdton; Humble Oil & Refining Co., Baytown, Tex.; Freeport Sulphur Co., Freeport, Tex.; Dewey Portland Cement Co., oil division, Dewey, Okla.; Phillips Petroleum Co., Whittenburg, Tex.; Marathon Oil Co., Bristow, Okla.; Ohio Oil Co., Sandoval, Ill.; and the Ohio Oil Co., Shreveport, La.

J. J. Forbes, of the Bureau of Mines of Pittsburgh, Pa., assisted Mr. Wallace in the management of the contests. The chief judges were C. F. Herbert of the Bureau of Mines, Bartlesville, and J. J. Delahide, of the E. D. Bullard Co., Houston, Tex.

METHOD OF LEAK PREVENTION ON HIGH PRESSURE GAS LINES

By James A. Martin
Superintendent of Maintenance, Lone Star Gas Co.*

The system used by the Lone Star Gas Co. to keep a check on leakage is primarily a simple problem of measuring gas bought and sold and subtracting gas delivered from gas received. But this becomes a more complex problem when the pipe lines are separated into divisions and a report made on each division. The total amount lost in all the lines is easily arrived at but separating the leakage and finding the points where it actually occurs is a larger task.

The main lines of the company are blocked into sections of varying lengths with a check meter at each dividing point. Gas through the inlet check meter added to the gas coming into the line inside the division gives total gas received, and the delivery through the outlet check meter added to gas sold or used in the division gives the total gas delivered. The difference between the gas received and delivered, all being reduced to the same pressure base before subtraction, indicates the leakage or gas lost in that particular section or division.

Since pipes of different diameters are contained in each section, it is necessary to select one standard size and reduce all sizes to lengths equivalent to the standard selected. Our company reduces all sizes to 3-inch pipe equivalent. The total leakage in each section is divided by the total length of equivalent 3-inch pipe and the result is expressed in terms of cubic feet lost per mile of 3-inch pipe. To convert pipe of varying sizes to equivalent length of 3-inch pipe, it is necessary merely to divide its diameter by three and multiply the quotient by its length. Since the circumference is directly proportional to the diameter, and the pipe surface for the same length is proportional to the circumference, the result from the formula above is the equivalent surface exposed. Hence, when the leakage is divided by equivalent length of 3-inch pipe, the result is loss per mile of 3-inch, or in other words, loss per unit area of pipe surface. The above formula is not to be confused with that for equivalent volume.

Accounting for Shrinkage

In order to determine correctly the leakage in each section, it is necessary to account for shrinkage through gasoline plants, all gas used for lease fuel, gasoline plant and compressor station fuel, and the hundreds of domestic consumers tapped off the main lines. Every new consumer and well or source tied into the line must be assigned to the proper division on the leakage report. A diagrammatic sketch of the whole pipe-line system, with each division named, is attached to each copy of the monthly leakage report and the loss in each section shown on the sketch. The sketch must be revised at intervals on account of new lines added. The monthly report shows leakage by divisions and total for the entire system for the current month and year to date.

The company has a total of approximately 75 measuring stations for the sole purpose of checking leakage. The meters are given as much attention as any other meters in the system, and when an abnormal leakage is indicated in any section we can be reasonably sure that it actually occurred.

Having established the existence and extent of the leakage we now take up ways and means of locating it. The actual repairing of a leak of course is the ultimate act that stops the loss, but let us remember the old wise-crack—"First catch your rabbit."

Vast Amount of Detail

There is a vast amount of detail, calling for an elaborate recording system, in the systematic search for the many minute openings in the long miles of high-pressure transmission lines. These records must be elastic, comprehensive and easily understood. The nature and thoroughness of the records depend to a certain extent on the size of the system, but it has been our experience that pipe line systems are prone to expand, therefore the records must be elastic. Next they must be comprehensive. That is, they must include all necessary details and be quickly and easily readable in order to control the following elements:

(a) Time element (to expedite repairs).

(b) Opportunity element (to determine when a line can best be spared in case a shutdown for repairs is necessary).

(c) Repair cost element (to weigh probable loss in leakage against loss in draining line plus cost of repairs).

(d) Locating cost element (to establish time and cost standard for the inspection of any particular division).

The system here presented, we believe, very nearly embodies these characteristics; at least it has been used successfully for nearly four years.

Dispatcher's Board

It might be well here to give a description of our dispatcher's board. This is a system map on a built-up soft pine board 8 feet high by 10 feet wide, scaled 4 miles to the inch, and showing counties, principal cities and rivers.

The pipe lines are shown by the radio insulating material known as "spaghetti" which may be obtained in red, black, green and yellow, and with some additional striping, serves as a legend for line sizes 2 to 20 inches. The lines are fastened to the board with map pins, also obtainable in colors, which fasten them in place and represent fittings as follows: White indicates an open gate valve, red a closed gate valve, green a regulator, blue operating through a bypass, black a positive meter, and a barred pin an orifice meter. We also use a ring topped pin which holds a tab on which is shown the telephone pole number giving definite locations and mileage to any point on the system.

This map, with tap lines shown coming off between main line gates, is a positive means of determining the consumers affected in case a section of line is shut down for repairs. The map also shows the boundaries of our 17 districts, each under the supervision of a district foreman. Each district is divided into from 3 to 13 divisions, thus making the units on which the records are based.

Inspection Department

Our inspection department consists of six crews, each having an allotment of divisions requiring about 90 days to cover (approximately 450 miles). An inspection crew consists of three men and a foreman. Our inspection schedule is based on four complete inspections each year.

Fittings above ground are inspected by "soaping" and inspection on buried lines is made by barring, that is, by sinking a bar to the top of the pipe at intervals of seven steps, on the theory that gas from a leak in intervening space will travel along the line to and up through the bar hole. The foreman follows in the wake of the crew, lines up bars to keep on pipe line, applies a match to each bar hole and when a leak is found, writes up location and size of leak. The size of the leak is indicated by the height of the flame at the bar holes. Leaks are classified as flash (F), small (S), medium (M), large (L), or very large (VL). In case a large or very large leak is found the foreman reports at once by telephone and a repair crew takes immediate action.

The search for leaks by inspection crews is independent of and in addition to that of a force of about 90 linewalkers, who cover the system on an average of every two days, but who look only for surface indications.

When the inspection of a division has been completed it is written up on a leak sheet in triplicate. A pink copy or work sheet goes at once to the district foreman. Both the original and a yellow copy are sent to the office where the yellow copy is filed in the reported file, while the original goes to the record clerk who, after carding the data thereon, mails it to the district foreman.

Checking Record

A form letter in three sections goes with the leak sheet. The top section is addressed to the pipe line superintendent and shows the district and division and line, the number of leaks, the date and cost of inspection and is signed by the chief inspector. The middle section is addressed to the district foreman and gives instructions as to repairs and is signed by the pipe line superintendent. The lower section advises the pipe line superintendent that repairs have been made. On receiving the original sheet the foreman copies on it the repairs as shown on the pink copy or work sheet as, and when made, and returns to record clerk. This transfer of data is made because the pink copy, having been used as a work sheet, is generally too soiled and tattered for a fastidious record clerk to touch.

Twenty days after mailing, if the original has not been returned showing repairs made, a first tracer is sent out, and 10 days thereafter a second tracer. These tracers are appropriate form letters. When the original with repairs shown is returned to the office, the yellow copy is taken from reported file, attached to original and filed in the repaired file. This particular division is then considered to be in good order until next inspection. In the meantime the record clerk has entered the data shown on the leak sheet on the division card. This card is for division of main line and taps thereon, and from it we get the "miles per day," "inspection cost per mile," "leaks per mile," "cost per leak," etc., for one complete division by lines.

Inspection Time

The inspection time, shown in days and tenths of days (one hour) in the "crew days" column, divided into miles, gives miles per day. Miles into cost of inspection gives inspection cost per mile, which is the important figure with regard to inspection. The value of this indicator is reflected in the decreasing cost per mile of inspection, as shown in inspection statistics, hereinafter set forth. The leaks per mile, leaks found divided by miles, reflects the effectiveness of work done by repair crews, and also readily indicates the trend of leakage on any particular division, thus showing where to direct special effort to reduce general average of leak rate.

The cost-per-leak column is of doubtful worth, but might be construed to indicate when an inspection can be profitably skipped, as in the case where the cost per leak to locate exceeds the probable cost to drain and repair a section of line. All of the above, of course, applies also to the district card, which shows all divisions of a district as a whole, and also on the system card on which all districts are incorporated, first for each quarter and finally for the year.

Complete statistics on leak prevention operations are given quarterly to all district foremen and inspection crew foremen, creating considerable rivalry, which reacts very satisfactorily for decreasing leak loss, as each foreman can see how the results of his efforts compare with those in charge of other districts. It may appear to some that this system is too elaborate, but due to the control it has given in the four years it has been used by us, not a single leak sheet has been lost, and the necessity for sending out second and even first tracers is comparatively rare. The saving realized on inspection costs alone amount to more than the cost of the record system.

*Before American Gas Association, Atlantic City, N. J., October, 1930.

WEST TEXAS FIELDS

(Continued from Page 57)

The discovery made 100 bbls. in five minutes when it made its first head, and consequently many estimated it good for more than 25,000 bbls. per day, but during the first 24 hours on open flow it made only 1,051 bbls. It is now standing shut down at 4,303 feet waiting for more storage. Four 500-bbl. tanks have been completed and six more are under construction. The Gulf Pipe Line Co., which has a looped 8-inch line into the McElroy Pool from Midland, will no doubt lay a gathering line to the discovery, and run the oil via Midland to Ranger and the Gulf Coast. The Shell Pipe Line Co., the Texas Pipe Line Co. and Humble Pipe Line Co. have lines running near the well, but as the Gulf Production Co. makes it a point to have its oil run through its own lines, a line may soon be laid to connect to the well.

The Gulf Production Co. owns several thousand acres around the discovery, Cranfill Brothers having an interest in the well, and acreage and offset acreage, and the Southland Royalty Co. has a one-eighth royalty under 17,920 acres of the Tubbs ranch, around the well.

Ward County Wildcat

Another wildcat which means considerable to another area is Texas Pacific Coal & Oil Co.'s No. 1 Barker in Section 27, Block B-29, Ward County, 4 miles north of the Shipley Pool. This test topped the pay at 2,256 feet and encountered an increase at 2,260 feet, now being shut down at 2,329 feet waiting on two 500-bbl. tanks which are being erected. It flowed 60 bbls. in five hours on October 12, looking as a small producer, but as it is producing from the same type of sandy formation as in the Bennett area to the northwest, and is running about 70 feet higher than the two producers in that pool, it has chances to drill considerable more pay, and possibly pick up more production.

WEST TEXAS PRODUCTION
Week Ending October 11

County—	No. wells	Bbls.
Andrews	2	10
Crane	368	26,685
Crockett	48	1,725
Ector	70	8,730
Fisher	8	1,890
Garza	..	None
Howard-Glasscock	527	23,495
Irion	7	180
Jones	73	1,369
Loving	28	2,380
Mitchell	148	2,387
Pecos	500	107,480
Reagan	253	22,567
Runnels	3	16
Scurry	5	10
Taylor	3	96
Upton	251	8,185
Ward	44	4,505
Winkler	591	61,085
Total production this week		272,789
Total production last week		270,134
Increase		2,655

Proration Meeting

A Crane-Upton and Ector County meeting was held in Fort Worth on Saturday, October 11, to discuss proration of these counties, and a probable change will be made from the present allowance of 150 bbls. per well as the minimum production in the Ector County Pool, under the present plan of proration, and the Yates Pool proration plan adopted, using the 25 per cent acreage and 75 per cent potential basis for proration. The present method does not seem equitable, allowing 40 per cent to 26 units and 26 per cent to 17 units.

The Gulf Production Co. offered the following formal protest in regard to Ector County, Crane and Upton County proration.

"Gulf Production Co. protests the proposed order affecting the field in Ector County, for the reason that no actual waste exists in this area, and the plan is unjust, discriminatory, and illegal.

"This company particularly protests the market outlet feature of said plan because the allowed production is not based upon the physical condition of the pool or area, but upon the whim of the purchasers of said field. It is not a conservation measure to prevent waste, and is discriminatory.

"This company further protests the marginal well provision of said plan, because it is discriminatory and increases rather than decreases waste, if any exists in said field, which is here denied. The plan discriminates in favor of the smaller wells against the larger wells. The provision is not a conservation measure.

"This company, therefore, respectfully protests the plan because it is not a conservation measure to prevent actual waste, it is discriminatory, and illegal.

Crane-Upton Protest

"The Gulf Production Co. has heretofore protested the proration plans now in effect in Crane and Upton Counties.

principally because these are old settled fields; this company has conservatively operated its properties in such fields; There is no actual waste, and the plans are not conservation measures for the prevention of actual waste, and are discriminatory, unjust and illegal.

"This company now makes the same protest to the proposed plan for these counties. And it further particularly protests that portion of Rule 1 of the proposed plan, which provides that the production of these fields shall not exceed 29,000 bbls., and provided that should the market be less than 29,000 bbls. daily, then the allowance for the field shall equal the margin, because in such case the allowable production would be based upon the caprice or whim of the purchasers in said fields. The plan is, therefore, not a conservation measure, its purpose is not to prevent waste, and it is discriminatory and illegal.

"This company further protests the proposed plan wherein all wells producing 12 bbls. or less shall not be prorated, but all wells producing more than 12 bbls. shall be prorated. Such plan would cause waste. It discriminates against the larger wells in favor of the smaller wells. The plan is not a conservation measure; it is not designed to prevent waste; and is discriminatory and illegal.

"For these reasons, among others, the Gulf Production Co., therefore, respectfully protests the proposed plan as applied to its properties in these counties."

Howard County Well

Greene Oil & Refining Co. and Getty Petroleum Corp.'s No. 1 L. C. Denman in the E half NW, Section 30, Township 1s, T.&P. Survey, eastern Howard County, 3 miles southeast of the Sinclair Oil & Gas Co.'s No. 1 Dodge estate, which opened up this new area about two months ago. First oil in the Greene well was encountered at 2,615-30 feet, and an increase logged at 2,662 feet and 2,703 feet. It is now shut down at 2,703 feet waiting on a new rig, with 2,600 feet of oil standing in the hole. The well means an extension of production, and the proving of a new pool of some extent, the first pool on the eastern side of the county.

Cromwell, Tanner and others' No. 1 University, formerly M. M. Rowan's No. 1 University in the center of the NE, Section 24, Block 16, about 4½ miles east of the Taylor-Link Pool, Pecos County, is now running rods and tubing preparatory to pumping. Top of the pay was found at 1,794 feet and total depth is 2,156 feet, although it was plugged back to 1,825 feet and shot with 80 quarts from 1,786-1,815 feet by the present owners. The hole cleaned itself and after standing three days made three heads in 48 hours, totaling 15 bbls. of oil and 10 bbls. of water, not looking like much of a well, but giving more possibilities and chances to a pool in this area.

Big Lake Oil Co.'s No. 4-C University in Section 1, Block 2, Reagan County, came in for the largest initial production of any of the deep tests yet completed below 8,000 feet. It topped the pay at 8,220 feet and produced about a year at that depth before being deepened to the present depth of 8,697 feet where it flowed an initial production of 2,937 bbls. with 55,000,000 feet of gas.

COMPLETIONS IN WEST TEXAS

Andrews County

Maer and others' No. 1 Mrs. Aver Meador, dry and abandoned, total depth 4,501 feet.

Crane County

Magnolia Petroleum Co. and Hardwick's No. 3 University, top pay 3,050 feet, shot 150 quarts 3,050-87 feet, initial production 40 bbls., total depth 3,087 feet.

Crockett County

Dixie Oil Co. and Amerada Petroleum Corp.'s No. 2 Powell, total depth 2,596 feet, plugged back to 2,572 feet, top pay 2,526 feet, initial production 150 bbls.

Ector County

Amerada Petroleum Corp. and others' No. 3-B University, top pay 3,540-47 feet, shot 200 quarts 3,545-3,682 feet, initial production 332 bbls., total depth 3,682 feet. Skelly Oil Co. and others' No. 3-A University, top pay 3,470 feet, initial production 850 bbls., total depth 3,614 feet.

Loving County

Henshaw and others' No. 1 Reagan and McElvain, total depth 4,254 feet, plugged back to 4,253 feet, top pay 4,248 feet, shot 140 quarts 4,226-53 feet, initial production 200 bbls. The California Co.'s No. 4 Reagan and McElvain, top pay 4,307 feet, plugged back to 4,223 feet, shot 160 quarts 4,280-4,323 feet, initial production 637 bbls.

Pecos County

Messenger and others' No. 2 Byrne, top pay 1,364 feet, initial production 110 bbls. in three days, total depth 1,398 feet.

Upton County

Eppenauer Drilling Co.'s No. 2 Chaney, top pay 2,453 feet, initial production 85 bbls. oil, 80 per cent water, total depth 2,454 feet.

Ward County

The California and Atlantic Oil Production Co.'s No. 1 Thomas, dry and abandoned, total depth 2,974 feet.

Gulf Production Co.'s No. 14 O'Brien, top pay 2,610 feet, initial production 195 bbls. in 12 hours, total depth 2,670 feet.

Runs Through Trunk Lines

Company, size and location—	Bbls.
Atlantic, 10-inch, Houston	21,441
Gulf, 10-inch, Ranger	41,571
Humble, 2 and 8-inch, San Angelo	34,396
Humble, 10 and 12-inch, Station "A"	29,310
Illinois, 2 and 8-inch, Del Rio	31,550
Magnolia, 8-inch, De Leon	24,856
Pasotex, 8-inch, El Paso	9,856
Shell, 10-inch, Healdton	33,661
Shell, 10-inch, Houston	26,202
Texas, 12-inch, Houston	15,608
Total	268,451

Runs to West Texas Refineries

Amarillo Ref. Co., Pyote	None
Big Spring Ref. Co., Big Spring	1,120
Burford Ref. Co., Pecos	3,350
Blue Bonnet Ref. Co., Wickett	None
Coaden Ref. Co., Big Spring	3,977
Col-Tex Ref. Co., Colorado	6,500
Great Western Ref. Co., Big Spring	2,718
Humble Oil & Ref. Co., McCamey	10,236
Richardson Ref. Co., Big Spring	5,065
Tonkawa Ref. Co., Pyote	None
Wickett Ref. Co., Wickett	175
Total	33,141

Tank Car Shipments

Texas Pacific C. & O. Co., from Hurdle	1,160
Fox & Thorsen, from Mertzon	180
Thomas-Brann, from Grant City	200
Reagan County Pur. Co., from Texon	166
Orient, from Hurdle	25
Southern Crude Oil Pur. Co., from Wickett	19,005
Total	20,736
Total daily average distribution	322,328
Total daily average production (including Lea County, New Mexico)	313,988
Daily average from storage	8,340

EFFECT OF SULPHIDE ON DRILLING LINES

(Continued from Page 64)

to produce maximum brittleness, and were then allowed to stand in the open air for 24 hours. The original degree of embrittlement decreased from 70.0 per cent to 12.8 per cent. At the end of seven days the embrittlement had dropped to 6.4 per cent, representing a recovery of 90.9 per cent of the ductility lost. Similar results can be effected in shorter times by heating. Systematic periods of rest or recovery would materially increase the life of uncoated steel drilling lines in sulphide fields.

The recovery is quite simply explained by the formation of molecular hydrogen and its diffusion from the steel.

Embrittlement of Annealed Wire

In order to verify the foregoing reasoning with direct evidence, brittleness tests were carried out on samples of the same wires after dead soft annealing. These results are given in Table 3.

The elimination of internal stresses was forcefully reflected by the type of fractures obtained. The angular breaks were obtained only from cold-drawn wire. As predicted, with the exception of the ingot iron wire, the maximum embrittlement of the annealed samples was much less than that found with cold-drawn wires. There was an inverse relation between carbon content and degree of embrittlement, the higher carbon wires embrittling less than the lower. From this it was concluded that the occlusion or absorption of atomic hydrogen increases as the purity of the iron, or, strictly speaking, the ferrite increases. The ingot iron, being nearly carbon free, is essentially pure ferrite, while in the steels containing carbon, the intergranular material, being the last to solidify, has a higher melting point, and is therefore ferrite of greater purity.

These conclusions explain the angular fractures of the cold-drawn carbon steel wires and their absence in the case of the ingot iron.

Prevention of Embrittlement

The most obvious method of combating embrittlement is by the use of protective coatings to prevent contact between the hydrogen sulphide and the steel.

The values of several common metals for the purpose were determined, with the results given in Table 4.

TABLE 4—PER CENT EMBRITTLEMENT OF METALLIC-COATED STEEL WIRES IN MOIST HYDROGEN SULPHIDE

Hours exposed	Protective metallic coating— Tin	Copper	Lead	Zinc A*	Zinc B†
24	74.0	+ 7.0	1.0	3.8	7.2
48	82.0	4.5	2.8	1.3	45.0
72	86.1	+ 7.0	8.6	6.3	45.7
96	86.3	+14.8	8.9	3.2	69.5
120	87.8	+13.5	+8.0	0.0	63.1

*Ordinary galvanized drilling wire. †Special galvanized drilling wire with very thin coating.

In consideration of these results it should be pointed out that the tests were of short duration and none of the coatings was tested to destruction, excepting the tin and the zinc B. The tin afforded practically no protection; zinc B gave partial protection for three days. Zinc A and lead furnished excellent protection for the total time of the tests, while copper not only gave complete protection, but the wire actually gained with respect to its initial rotary endurance strength.

The results given by ordinary galvanized drilling wire agree with field experience. In the early days of drilling in West Texas it was customary to start a new black steel line at the top of the pay. If possible the well would be completed with the same line and another started. Usual service averaged less than one well per line. It is now general practice to use galvanized lines for drilling in all wells. Uncoated lines are used to top the pay. Galvanized lines so used average five or more wells before it becomes necessary to discard them. They are unsuited to ordinary drilling, however, because of their lower strength and resistance to abrasion. Very substantial economies in both time and expense have resulted from their use in the manner outlined. A test of a copper-clad drilling line in this area would be of considerable interest.

Further tests on wire coated with a light grease have given much less embrittlement, indicating that frequent lubrication of drilling lines would lessen their susceptibility to embrittlement. Any chemical treatment of the lubricating oil which would keep the steel preferentially wet with oil rather than water would be of real value also.

Additional experiments are now in progress on other coatings, alloy steels, and the effects of hydrogen sulphide on other physical properties of steels.

Conclusions

1. A sensitive method has been developed for determining the degree of embrittlement in steel wire.

2. Plain carbon steels become rapidly embrittled when subjected to the action of moist hydrogen sulphide.

3. The embrittlement is caused by the absorption of atomic hydrogen formed from the reaction between hydrogen sulphide and iron.

4. In cold-worked plain carbon steels the degree of embrittlement is proportional to the amount of cold work and has no relation to the carbon content.

5. In dead soft annealed plain carbon steels the degree of embrittlement is inversely proportional to the carbon content.

6. Absorption of atomic hydrogen occurs mainly in the purest ferrite—that is, intercrystalline material of carbon steels and more or less uniformly throughout pure iron.

7. Steel wire embrittled by hydrogen sulphide recovers nearly all of its original ductility after standing for a time or by a gentle baking for a few hours.

8. The life of uncoated steel drilling lines in sulphide fields may be substantially increased by systematic periods of rest or by heating to 400° F. for three hours.

9. Embrittlement may be prevented by various protective metallic coatings or other materials which prevent hydrogen sulphide from coming into contact with the steel.

10. Galvanizing has been shown to form an excellent protective coating, both in the laboratory and in actual drilling service.

11. Lead and copper coatings appear to possess protective ability against sulphide embrittlement, but tin is worthless.

Acknowledgments

The authors wish to express their appreciation to the Williamsport Wire Rope Co., the Hazard Wire Rope Co. and the Broderick & Bascom Rope Co. for samples used in this investigation. Also they acknowledge the aid of F. J. Reed and S. J. Edge of the Gulf Laboratories in the experimental work carried out.

The foregoing paper on the "Effect of Hydrogen Sulphide Embrittlement of Wire Rope," was discussed by Dudley R. Dale, with the S. M. Jones Co., Tulsa, who pointed out how the findings of Mr. Vollmer and Mr. Wescott can be applied to problems confronting operators in limestone areas of oil production where sucker rods have been broken in comparatively short time after being run in wells.

"Hydrogen sulphide embrittlement of steel in oil field equipment is not a new problem," said Mr. Dale, "but rather a relatively unknown one, and discovered comparatively recently. The similarity of the duties of drilling lines and sucker rods makes direct comparison possible, for both are subjected to alternate and repeated high stresses produced by the reciprocating motion given them by the movement of the walking beam, and both operate in the presence of hydrogen sulphide in some wells. The meager amount of information now available concerning this type of equipment failure makes this paper particularly valuable at this time."

"Sucker rods, unlike wire lines, are not manufactured of cold worked material. The best practice, at this time, in the manufacture of sucker rods is to use hot rolled steel, which after the necessary forging operations are completed, is given a complete normalizing heat treatment. This is done to remove local heat demarcations, forging strains, and to refine and make uniform the microconstituents of the steel. The rods are therefore initially in a condition of strain equilibrium. The results shown in Table 3 of the Vollmer-Wescott paper applies to sucker rods.

"Sucker rods are usually made of straight carbon steel, the carbon varying from .30 to .55 or .60 per cent, with the manganese varying from .50 to 2 per cent, phosphorous and sulphur being .04 per cent maximum.

Puzzled by Premature Failures

"For many years rod manufacturers and producers have been puzzled by premature failures, which could not be explained by an analysis of the pumping loads and their relation to the physical properties of the steel of which the sucker rods were made, notwithstanding that analysis showed a high factor of safety.

"A study of crooked holes, tight or sanded working barrels, inertia loads, etc., did not explain some of the failures which we now attribute to hydrogen sulphide embrittlement following the line of reasoning set forth in the Vollmer-Wescott paper.

"One example of a condition of this kind is cited. In a West Texas well new rods of one make started to break at the end of four days' time after installation, and another make of rods started to fail in from 10 days to two weeks after installation. Pumping loads, speed, size of tubing, depth of pump and other conditions were studied and it was found that the rods had a factor of safety in physical properties which should have given reasonable performances. Analysis

of the fluid, however, showed a high hydrogen sulphide content.

"Rods taken from this well showed the typical progressive fatigue fracture invariably found on most rod failures. These fractures were smooth and silky for approximately half of the cross section of the rod and somewhat coarse and crystalline for the balance of the cross section. All of these fractures are approximately at right angles to the axis of the rod.

Bending Test Applied

"Some of these rods immediately upon being pulled from the well were given a bending test by bending a derrick leg and broke with a brittle snap after passing through an angle of between 40 and 50 degrees from the starting point. New rods can be cold bent 180° without fracture.

"Samples of these prematurely failed rods were sent to a laboratory for examination. Chemical analysis indicated that they were up to standard and did not reveal the possible cause of the trouble. Physical tests also showed that the rods were up to standard and the Brinell test showed a slight increase in the steel in hardness. Microscopic study of the rods was also made, but did not reveal material change in its character that would indicate why they had failed so quickly.

"After the laboratory examinations failed to reveal any satisfactory answer to the problem or show any fault with the material, some of the broken rods, which, in the meantime had lain on the ground for about 10 days, were again given the bending test with good results for it was found that the steel had recovered its former ductility.

"It was then concluded that the steel was absorbing something which had an embrittling effect as long as it was in contact with the fluid in the well, but which was self purging if given a period of rest or other natural treatment. An examination of the fluid revealed a high content of hydrogen sulphide and it was a well known fact that steel was embrittled by hydrogen, it was justly concluded that the answer to the problem had been found. It also explained why laboratory tests had not given the answer as the samples had opportunity to purge themselves of the hydrogen during the time they were going to the laboratory and awaiting testing.

Rest Treatment for Sucker Rods

"Some manufacturers and producers have advocated a rest treatment for sucker rods, some even going so far as to recommend an annealing treatment with the thought in mind that the rods were in a highly strained condition due to the work they were required to perform. It was thought that a condition similar to what is known as 'Stead's Brittleness' was acting upon the rods. As it is a well known fact that Stead's Brittleness only occurs in steel of low carbon content (under .15 per cent) where it has been subjected to temperatures of 900° to 1,400° F. for long periods of time, and this treatment results in an enlarged grain growth. Sucker rods are made of .30 to .60 carbon steel and not being subjected to any such temperatures could not have developed Stead's Brittleness.

"It is also our opinion that many sucker rod failures can be attributed to varying degrees of sulphide embrittlement depending upon the time the failure commenced, which condition was in turn affected by the percentage of gas present.

"It has been found that where premature failure of sucker rods occurs due to hydrogen sulphide embrittlement the steel will nearly recover its original ductility if allowed to rest in the open air and sunlight for comparatively short periods of time, and as Mr. Vollmer and Mr. Wescott have stated, this can be made more complete by a gentle heat treatment.

Danger in Oil Field Heat Treatment

"There is danger in giving sucker rods an oil field heat treatment because improper equipment and supervision might result in unequal heating. Under proper conditions of heating and supervision it should be beneficial.

"It is also a fact that where rods have been in service long enough to start a fatigue fracture, no heat treatment other than welding, will repair the damage. Nor will the rest treatment be of any advantage where fracture has started and it is recommended only to remove hydrogen which is causing embrittlement."

Mr. Dale agrees with the authors of this paper in their statement: "Embrittlement in annealed or normalized steels is inversely proportional to the carbon content of the steel, and is caused by the absorption of atomic hydrogen formed from the reaction between iron and hydrogen sulphide. The mechanism of the embrittling action is first the reduction of oxide by the hydrogen which forms water, which in turn causes a swelling in the grain boundaries. This increase in volume will create a stress and this added to the pumping stress causes the rupture.

"Messrs. Vollmer and Wescott have constructed a testing machine which in theory and practice should give results which can be relied upon. A bend test is first a test of surface of the material, where the maximum effect of the embrittlement is encountered. The combined rotating and bending of the test specimen reacts on all point of the circumference where bending is concentrated.

Small Test Samples Used

"While Messrs. Vollmer and Wescott have been able to test individual wires of the complete wire line, this procedure is not followed in the testing of sucker rods. Small test samples, made to fit the standard Moore rotating fatigue machine, are used instead.

"In conclusion it may be stated that physical, chemical and microscopic tests do not reveal hydrogen embrittlement. Immediate bend test as soon as the rods are pulled from the well and comparison of the results of this test with others to be made after the rods have been rested or treated will often give good comparative evidence of embrittlement.

"Protective coatings have been found that show some improvement in the rods upon which they have been applied, but this improvement for the most part is only temporary and probably not worth the expense of application.

"Zinc galvanizing seems to slightly improve performance, but it is not an ideal coating as it has a tendency to peel and flake, especially if the rods are stressed beyond the elastic limit of the steel.

"It is also the opinion of some operators who have used galvanized rods extensively that the extra cost did not compensate them for the slight increase in service over black or ungalvanized rods, and that it is temporary relief at the most.

"Leadized rods are now being tested, and from the conclusions of Messrs. Vollmer and Wescott should show good performance.

"While this discussion of hydrogen sulphide embrittlement of sucker rods is rather apart from the paper presented by Messrs. Vollmer and Wescott, the results obtained by them and the conclusions reached were so clearly applicable to sucker rods that it is felt that the paper is doubly valuable to the petroleum industry."

NORTH TEXAS OIL ASSOCIATION FILES COMPLAINT WITH COMMISSION

AUSTIN, Tex., Oct. 13.—The Railroad Commission of Texas has given notice to the Continental Oil Co., Humble Oil & Refining Co., The Texas Company, Gulf Production Co., Sinclair Crude Oil Purchasing Co., Shell Petroleum Corp., Prairie Oil & Gas Co., and to all other common purchasers of crude oil in the North Central Texas district and to all other parties interested that the commission will at 10 a. m., October 22, 1930, at Austin, take up and consider the complaint of North Texas Oil & Gas Association.

After reciting the railroad commission fixed the amount of oil which could be produced within the State of Texas for a period of 90 days beginning August 27, 1930, entered an order allocating to the various fields and districts the aggregate amount of production allowable under such proration order, and allocated to the North Central Texas district the sum of 69,000 bbls., the complaint argues:

"That the amounts allocated to each district in such allocation order represent the amounts which, in equity, the producers in each such district should be permitted to produce during said 90-day period and the producers in no district should be, in equity, required to produce less than the amounts specified and allocated in said order.

"That in violation of the laws of the State of Texas, the common purchasers are unjustly and unreasonably discriminating against the North Central Texas district in the purchase of oil produced in said district in that such common purchasers are failing and refusing to purchase ratably as between all districts in this State, the amount of oil which such district is permitted to produce under such proration and allocation orders and such common purchasers are purchasing all of the oil tendered to them for purchase in many of the districts of this State, particularly the Gulf Coast district, and are refusing to purchase all of the allowable production tendered to them for purchase in the North Central Texas district.

"That such action on the part of said common purchasers constitutes unjust and unreasonable discrimination against the tenderers of oil in the North Central Texas district for the reason that each common purchaser of oil within this State should allocate ratably its takings of oil within this State to the various fields and districts within the State. That such common purchasers are failing and refusing so to allocate their purchases but are as aforesaid purchasing all oil tendered to them for purchase in certain districts within the State and are refusing to purchase oil tendered to them for purchase within the North Central Texas district.

"That each of the common purchasers above named have facilities for receiving oil tendered to them for purchase within said North Central Texas district and each of said common purchasers should be required under the law to make available to the producers of said district the proper ratable market created by their respective demands for oil within this State.

"Your complainant prays, therefore, for a hearing on this complaint by your honorable body and that notice issue to each of said common purchasers above named, requiring them and each of them to show cause why they are failing and refusing to purchase oil within this State without unjust and unreasonable discrimination against the North Central Texas district and the producers of oil within said district and for an order requiring the ratable purchase of oil within this State by such common purchasers without such unjust and unreasonable discrimination, and for such other and further orders in the premises as may be warranted and proper."

ELECT O. L. CORDELL V. P. OF PHILLIPS COMPANY

(Continued from Page 130)

Des Moines, Minneapolis and Omaha divisions.

Lane Dunnigan, former division manager for the Phillips company at Kansas City, has been transferred to Bartlesville, Okla., as division manager. Charles Dwinning, former division manager at Kansas City for the Independent company, will continue as division manager at that point for the consolidated companies.

R. O. Fowler, former division manager at Des Moines for the Independent, will continue in the same capacity for the Phillips company succeeding L. B. Hancock who has resigned.

W. E. Steele, former division manager at Omaha for the Independent, will continue in the same capacity for the consolidated companies. Jeff Boucher, former district manager for the Independent in Oklahoma, will continue in the same capacity for the Phillips company. A. P. Scott, former acting manager at Bartlesville for the Phillips company, has been appointed assistant to Mr. Boucher.

The station properties of the Phillips and Independent companies are being consolidated as rapidly as possible. The Independent trade names and insignia are being replaced with the Phillips names.

GASOLINE SPECIFICATIONS APPROACH FINISHED FORM

(Continued from Page 130)

The endpoint shall not be higher than 225° C. (437° F.).

The residue shall not exceed 2 per cent.

Per cent evaporated shall be found by adding the distillation loss to the amount collected in the receiver at each specification temperature.

Sulphur—Method 520.11. Sulphur shall not exceed 0.10 per cent.

Vapor Pressure—Reid Method. The vapor pressure at 37.8° C. (100° F.) shall not exceed 8 pounds per square inch.

If the temperature at which 10 per cent is evaporated is not below 70° C. (158° F.), the vapor pressure test shall not be required.

Motor Fuel F

Distillation Range—Method 100.13. When the thermometer reads 65° C. (149° F.) not less than 10 per cent shall be evaporated.

When the thermometer reads 140° C. (284° F.) not less than 50 per cent shall be evaporated.

When the thermometer reads 200° C. (392° F.) not less than 90 per cent shall be evaporated.

The endpoint shall not be higher than 225° C. (437° F.).

The residue shall not exceed 2 per cent.

Per cent evaporated shall be found by adding the distillation loss to the amount collected in the receiver at each specification temperature.

Sulphur—Method 520.11. Sulphur shall not exceed 0.10 per cent.

Vapor Pressure—Reid Method. The vapor pressure at 37.8° C. (100° F.) shall not exceed 12 pounds per square inch.

If the temperature at which 10 per cent is evaporated is not below 50° C. (122° F.), the vapor pressure test shall not be required.

Motor Fuel V

Distillation Range—Method 100.13. When the thermometer reads 70° C. (158° F.) not less than 10 per cent shall be evaporated.

When the thermometer reads 125° C. (257° F.) not less than 50 per cent shall be evaporated.

When the thermometer reads 180° C. (356° F.) not less than 90 per cent shall be evaporated.

The endpoint shall not be higher than 205° C. (401° F.).

The residue shall not exceed 2 per cent.

Per cent evaporated shall be found by adding the distillation loss to the amount collected in the receiver at each specification temperature.

Sulphur—Method 520.11. Sulphur shall not exceed 0.10 per cent.

Vapor Pressure—Reid Method. The vapor pressure at 37.8° C. (100° F.) shall not exceed 10 pounds per square inch.

If the temperature at which 10 per cent is evaporated is not below 60° C. (140° F.), the vapor pressure test shall not be required.

NEW SPANISH CONTRACT

The Spanish Petroleum Co. has made new contracts with the Fuel Monopoly. The company hopes to be able to supply 70 per cent of Spain's consumption.

CREOLE CORPORATION CAPITAL INCREASE

(Continued from Page 136)

holders under proposal that shares will be returned unless 51 per cent of stock is deposited by November 15. Consolidated Royalty stockholders last year approved an increase in capital from 500,000 shares to 1,000,000 shares of $10 par value. Both companies have royalty and working interests in Salt Creek and other Wyoming fields and in other states.

Indian Refining Co.

At a meeting of the Indian Refining Co., Col. J. H. Graham, formerly president, was elected chairman of the board, George d'Utassy, formerly vice president, was elected president of the company and Dr. Frank Fritts resigned as vice president to engage in educational work.

Columbia Gas & Electric

Columbia Gas & Electric Co. declared regular quarterly dividends of 50 cents on the common stock, $1.50 on the 6 per cent and $1.25 on the 5 per cent preferred stocks, all payable November 15 to stock of record October 20.

Oklahoma Natural Gas

Oklahoma Natural Gas Corp. reports for year ended July 31, 1930, gross earnings of $10,962,083 as compared with $10,614,394 in preceding 12 months. Operating profit after expenses, maintenance and taxes was $4,682,761, against $4,418,610 in year ended July 31, 1929.

Paragon Refining

The Paragon Refining Co., the dissolution of which was recently voted, announces that it will take up all of the Class A stock paying at the rate of $50 a share plus dividends to October 15. The redemption of the Class A stock will require $2,004,809.

Independent Oil & Gas

Independent Oil & Gas Co. has called stockholders to vote in Tulsa, on November 8, on dissolution of the company and distribution of its assets among them.

Tide Water Oil

Tide Water Oil Co. declared regular quarterly preferred dividend of $1.25 payable November 15 to stock of record October 17.

Union Oil

Union Oil Co. of California reports for the nine months ended September 30, after all charges and reserves for depreciation, depletion and drilling expenditures, a net profit of $8,000,000 equivalent to $1.84 a share on the 4,345,120 capital shares outstanding at the end of the period.

GAS MEN MEET IN MEMPHIS NEXT MAY

(Continued from Page 29)

one of the major industries today, and strongly recommended comprehensive conservation activity by the industry to perpetuate the supply of natural gas.

Edgar G. Hill, of Ford, Bacon & Davis, Inc., and the Southern Natural Gas Corp., and George I. Rhodes, also of Ford, Bacon & Davis, Inc., presented a joint paper reviewing the rapid strides in long distance natural gas transmission pipe line construction during the past five years and predicting further revolutionary changes in pipe line construction and operation which may revolutionize the entire industry within another generation.

James A. Martin, superintendent of maintenance for the Lone Star Gas Co., Dallas, Tex., reviewed in comprehensive fashion steps necessary for leak prevention of high pressure gas transmission lines.

Big Attendance

There was an estimated attendance of 5,000 at the general and special sessions of the American Gas Association. Clifford E. Paige, vice president of the Brooklyn Union Gas Co., was elected president of the association for 1930-31, succeeding Bernard J. Mullaney, vice president of the Peoples Gas, Light & Coke Co., of Chicago. There were a number of interesting papers relative to natural gas and oil presented at the other special sessions at the convention here.

R. E. Fisher, of the Pacific Gas & Electric Co., San Francisco, speaking before the commercial section, outlined the development of natural gas sales. The industrial gas section meeting on Thursday will feature talks on "Industrial Sales and Service Problems Encountered in Changing Over from Manufactured to Natural Gas," by J. H. Gumz, of the Pacific Gas & Electric Co.; and "Gas as a Competitive Fuel for Large Scale Pottery Burning," by W. M. Taylor, of the Ohio Fuel Gas Co., Columbus, Ohio.

New markets for appliances and equipment resulting from the use of butane and propane were discussed before the meeting of the manufacturers' session today by R. W. Thomas of the Philfuels Co. of Detroit.

Other features of general interest to the oil and gas industry scheduled during the progress of the convention include a talk on how the change over from manufactured to natural gas has affected company advertising and publicity, by F. R. Jamison of the Public Service Co. of Colorado, Denver; "Substitution of Natural Gas for Manufactured Gas in Public Utility Operations," by George Wehrle, superintendent of the gas department of the Public Service Co. of Colorado; report of the subcommittee on cooperation with the oil industry on the utilization of petroleum products, by Joseph A. Perry, chairman of the United Gas Improvement Co., Philadelphia, Pa.; "Natural Gas Replaces Oil Gas in Pacific Gas & Electric Co.," by W. S. Yard of the Pacific Gas & Electric Co.; "Gas Pipe Line Factors Affecting Minimum Costs," by W. R. Kepler of the A. O. Smith Corp., Milwaukee; and "The Use of Heavy Fuel Oil in the Manufacture of Carburetted Water Gas," by P. T. Dashiell of the Philadelphia Gas Works Co.

The exhibition of gas appliances, equipment, etc., in the auditorium hall is attracting huge throngs daily. There are more than 250 exhibitors showing their products this year.

OBERFELL OUTLINES ECONOMIC FACTORS

(Continued from Page 129)

pressure testing method by the Interstate Commerce Commission. This method had previously been approved by the Natural Gasoline Association and the American Petroleum Institute, and since that time the method has been tentatively standardized by the American Society of Testing Materials. The method has also been proposed as a basis for one of the important specifications for U. S. Motor gasoline. It is now primarily a question of details.

"Butane as an ingredient of natural gasoline has been praised to the skies. Evidently there is a limit to the amount of butane that the refiner can use. This amount is restricted by the vapor pressure limit of the finished gasoline. To argue that butane is worth to the refiner just as much as the remaining components of natural gasoline is idle talk. The refiner can not afford to pay any more for butane laid down at the refinery than is represented by the entire cost of extracting the butane fraction from his refinery gases. By entire cost I mean all costs encountered, such as the value of the butane as a fuel in the refinery gases, capital charges, manufacturing costs, and other costs that rightfully belong to the charges against the removal of butane from the refinery gases.

"If this statement is true, and it can not be refuted from an economic viewpoint, then in event of an excessive supply of butane it should demand a lower price than the other components of natural gasoline. This also means that butane is the component responsible for the major portion of the vapor pressure of natural gasoline; that as long as there is an excessive supply of butane that natural gasoline of lower vapor pressure will eventually demand the higher price. Finally, the best argument regarding the value of butane is found in the fact that butane can at present be purchased at a price lower than that of natural gasoline."

CRUDE SITUATION IS FACTOR IN MARKET

(Continued from Page 28)

hoped that general reductions could be averted through the curtailment agreements which are effective in most producing areas and which have as their aim the balancing of supply and demand so that excess supplies will not be available. The unfortunate feature of this plan, which has been generally successful so far as crude production operations are concerned, lies in the fact that it has not brought a strong refinery market necessary if it is to receive the support of that part of the refining industry which buys the bulk of its crude oil supplies and sells its refinery output on a tank car basis.

Within the tank car marketing trade it has brought a variety of opinions as to the soundness of conditions and probable future price trends. Most observers are predicting a continuance of low prices through the remaining fall and winter months.

Gasoline and Naphtha

Some of the largest spot orders for gasoline are coming from jobbers who are operating cut rate stations at middle western points. The business of some of these companies has increased to the point where they are now buying as high as 75 cars a month. Several of these companies have adopted a plan of asking for bids. A few sellers in their anxiety to move gasoline are constantly lowering their prices in bidding for this class of business and few hazard a guess as to when this type of competition is to end.

The position of these cut price jobbers is not as strong as it was during the summer months and it is due to this fact that they are constantly asking for lower prices from their refinery sources of supply. In addition to the 2-cent general reduction recently announced in gasoline tank wagon and service station prices throughout the Middle West, there have been additional local reductions so that in many cases the station prices of the larger distributors are the same as the cut rate stations which during the summer months were selling from 2 to 5 cents a gallon under the general market.

So far as spot prices on gasoline are concerned, they start at a low of 5 cents for the U. S. Motor grade with a spread up to 6½ cents. On the 400 endpoint grade the low is 5¼ cents, 390 endpoint 5½ cents and 375 endpoint 5¾ cents. As in the case of U. S. Motor the prices of individual refiners range up from these lows 1½ cents.

Kerosene

There has been some export buying of kerosene in both North Texas and North Louisiana the past week. Although this material was sold at low prices, it aided the stock situation of the refiners who participated and domestic prices were firmer. Price ranges in Oklahoma are unchanged with the 41-43 water white grade selling at 3⅛ to 3¾ cents. The domestic demand is routine with little spot buying.

It is felt that the recent 2-cent decline in kerosene tank wagon prices in the Middle West will stimulate buying and cause farmers who had been purchasing gasoline as fuel for their tractors and other farm machinery to return to kerosene.

Furnace Oils

Refiners with furnace oil material ranging from the high gravity fuel oils to the prime white distillates have plenty of inquiries and buyers. Zero cold test grades are scarce. Buyers state that some grades were unobtainable for immediate shipment.

A 28-30 low cold test fuel oil sold as high as 90 cents, which is more than is being obtained from the industrial grades of gas oil in some cases. The 32-36 gravity gas oil of low cold test and flash under 200 is bringing a low of 2½ cents regardless of color with most sales at 2⅝ to 2¾ cents. The regular distillates of 36 to 40 gravity range up to 3¼ cents.

Natural Gasolines

All grades of natural gasoline dropped from 6 to 5¾ cents. The spot demand has slowed up for all grades although many manufacturers contracted for their month's output early in October. Several buyers are endeavoring to secure additional concessions on spot purchases.

Lubricants

Some grades of Oklahoma bright stock sold under 20 cents last week. Other sellers have not changed their prices since early in September. Wax trading is dull both for spot shipment and delivery over the remainder of the year.

GENERAL WEAKENING IN COASTAL MARKETS

HOUSTON, Tex., Oct. 14.—A general weakening of Gulf Coast refinery markets with the possible exception of gas oils was indicated at the opening of this week as a result of the unsettled conditions which have existed for some weeks. There have been reductions of approximately a quarter cent in gasolines, from a half cent to a cent in pale and red oils and 10 cents on cargot lot bunker oil.

Motor fuel gasoline, which for several weeks has been maintained fairly steadily at 7 cents, was being quoted on spot market from refineries here at 6¾ cents low Monday and Tuesday. Material on contract based on North Texas prices was moving as lew as 6½ cents following the sharp weakening in that area. The unsettled crude situation together with an increasing irregularity in retail prices here which may force a general tank wagon cut shortly is adding very materially to the sloppiness of the tank car outlook.

The fuel oil situation continued stagnant as far as spot sales were concerned. This, however, was not the basic cause of the slipping of quotations in the Gulf Coast as no sellers apparently are suffering from the long slow period in which they have found themselves. The weakness, according to sellers, is largely because of the exceptionally weak situation on the Atlantic Seaboard. Large amounts of Venezuela crude being dumped on the Atlantic Coast recently has further unstabilized the market there and due to fuel moved out of here based on that market prices here have been forced lower. Considering the bunker rate of 14 cents from Gulf ports to north of the Hatteras quotations of 65 to 70 cents for cargo sales show the Gulf market as materially firmer than that on the East Coast.

Inquiries for gas oil continued to come in although sellers here have shown no inclination to transact business on the buyers' idea of the market. Refiners have been holding firmly for a minimum of 3¾ cents for delivery over the burner oil season, and firm bids of 3½ cents so far have been passed up.

Pale and red oils have experienced possibly the greatest weakening after a long period of marking time. The need for new business lately brought on scattered concessions as demand failed to take care of production and stocks and as this week opened sellers generally made wholesale cuts in posted prices.

TARIFF INQUIRY IN TULSA

Five agents of the United States Tariff Commission came to Tulsa from Washington last week to investigate the cost of producing oil in the Mid-Continent fields so that the commission may balance this against the cost of producing Venezuelan oil and report the facts to Congress. The investigators in Tulsa were Peake Vincil, engineer, and Kenneth L. Stone, Max Joseph, J. W. Zimmerman and Harry Stouter.

AVERY D. ANDREWS RESIGNS

After more than 11 years of service, Avery D. Andrews has resigned as the American representative of the Royal Dutch-Shell group and as chairman of many of its subsidiary American companies, effective December 31.

DEATH OF J. R. BROOKS

J. R. Brooks, father of J. H. Brooks, vice president of the Republic Supply Co., and of J. R. Brooks of the Atlas Supply Co., passed away early this week at his home in Casey, Ill. The sons went to Casey to attend the funeral.

COMMISSION HEARING TESTIMONY ON PRORATION

(Continued from Page 29)

totally inadequate to handle the production.

E. B. Reeser, president of the Barnsdall Corp. and of the American Petroleum Institute, took the witness stand Monday before the Corporation Commission to testify in behalf of proration.

Attorneys for the C. C. Julian Oil & Royalties Co. and the Champlin Refining Co. and others seeking to break the curtailment program in this State, attempted to show that the terms of the proration orders were directed by the Standard Oil Co. and other major companies. Mr. Reeser would not testify that that was a fact.

Mr. Reeser told the commission that proration had been adopted in Texas, California, Kansas, New Mexico, Wyoming and Oklahoma. Operators are alarmed only in connection with the menace of waste resulting from overproduction, he asserted. He placed the potential production of the nation at from 5,000,000 to 15,000,000 bbls. daily and the market demand, which he said was fairly steady, at 2,500,000 bbls. daily.

Each State Acts for Itself

Notwithstanding prolonged cross-questioning by Bert Parmenter, attorney for Mr. Julian, Mr. Reeser reiterated testimony that each state determines how much it should produce after ascertaining the market demand from pipe line companies and purchasing agents operating in the state. He declared that price did not enter into the curtailment program.

Pointing out that Standard Oil pipe lines run from the Oklahoma City Field to company refineries in New Jersey, Attorney Parmenter attempted to obtain from the witness statements that the Standard advised the state what production it should have. He also questioned Mr. Reeser in connection with testimony that records of the American Petroleum Institute, which held its meeting in Tulsa last week, are in New York. Mr. Reeser said the secretary's office is in New York. The Institute, he testified, approved proration plans of the various states, but price, he said, was not mentioned.

Mr. Bradford's testimony closed the case at noon today for the petitioning proration committee. When Commissioner C. C. Childers, chairman, asked the attorneys for the protestants how much time they would occupy in presenting their side of the case he was told that it would take the remainder of the week. R. H. Brown, attorney for operators in Stephens County, asked that they be heard this afternoon but the commissioners, in adjourning for the noon recess, set Thursday, October 23, for them and objectors in certain other fields to be heard.

Sessions Began October 9

The present series of proration sessions before the Corporation Commission began on Thursday, October 9, when the Julian Oil & Royalties Co. appeared before the commission with a protest against a continuance of the curtailment of crude oil production on the ground that it was a violation of the antitrust laws of the United States. The Julian company claimed that the intent back of the whole curtailment movement was to fix prices of crude oil. John Head, attorney for the Julian company, also alleged that the Oklahoma state conservation law was in violation of the fifteenth amendment to the Federal Constitution, which forbids the taking of property without due process of law. Head claimed that the Corporation Commission has never asked for money with which to pay for the machinery of proration, with its umpires and assistants and incidental expenses, but that all this was paid for by oil companies favoring the proration movement. Head further said that even if the commission had the power to act there was room for protest because, he claimed, the proration as carried out was discriminatory in that some wells were permitted to produce 100 per cent, while others are cut down to 5½ per cent. Julian's contentions were all repetitions of what has been said before by the few operators who have objected to the curtailment of crude production in Oklahoma.

Extension to October 20

On Friday, October 10, the Corporation Commission issued a temporary order extending September proration program to October 20. Wirt Franklin, in behalf of Oklahoma producers, appeared before the commission asking an order of the commission to curtail production to 550,000 bbls. per day in October; 540,000 bbls. per day in November, and 535,000 bbls. per day in December, but with a change from the September program that called for the production of approximately 57,000 bbls. per day less in the old heretofore unprorated fields in Oklahoma. This 57,000 bbls. per day was allotted to the Oklahoma City Field in the new proposed schedule, bringing its allowable production up to 131,000 bbls. or more per day during the three months. The schedule had been made up by the proration committee of the Mid-Continent Oil and Gas Association, the membership of which is open to and includes oil producers of all degrees of importance in Kansas, Oklahoma, Texas, Louisiana and Arkansas, and accepted by producers at a public meeting held in Tulsa on Friday, October 3. The Corporation Commission had already extended the September program to October 10 and made the extension to October 20 so that the curtailment movement would be maintained while the present arguments for and against the last quarter schedule could be heard and decided upon.

Champlin's Objection Heard

At Friday's session the Champlin Oil & Refining Co. of Enid was the principal objector to the proration plan, H. G. McKeever appearing for the Champlin interests. Ray M. Collins, who has been the state umpire since the beginning of proration in 1927, took the stand and after relating that the market for Oklahoma crude oil did not exceed 550,000 bbls. a day and that no oil purchasing company was willing to take excess oil and store it above ground, and that any production in excess of the quantity named in the petition was superfluous and unmarketable, was subjected for hours to a severe cross-examination by attorneys for the Julian company and the Marco Oil & Royalties Co. Frank W. Burford, appearing for the Oklahoma City operators who favored the Frankline petition, took the witness' part and engaged in a number of wordy battles with the lawyers for the protesting companies.

William H. Gray of Tulsa, representing the Mid-Continent Royalty Owners Association, presented a motion asking for a delay in the consideration of the petition to give royalty owners a chance to study the terms of the curtailment program in so far as they affected the wells at present in the nonprorated class. The commission overruled Mr. Gray, who was told that there had been plenty of time for study since the publication of the terms of the proposed schedule.

In his testimony Umpire Collins reviewed the production and demand situation in so far as it related to Oklahoma oil. He said he had interviewed 57 crude oil purchasers on their requirements for the last quarter of the year and that the proposed schedule fitted in with crude oil demand.

Victor H. Smith Testifies

On Saturday Victor H. Smith of the White Oak Refining Co. and other oil units, testified that in his opinion disastrous results to the oil industry would follow the lifting of proration orders in Oklahoma. Mr. Smith gave it as his opinion that whether or not proration continues the price of oil will decline.

Wilcox Company Protests

George H. Dye, vice president of the H. F. Wilcox Oil & Gas Co., appearing on behalf of that company, testified that the proposed schedule for the last quarter of the year would be detrimental to the Wilcox company and that it would have to shut down its refinery at Bristow as it will be operating at a loss of 71 cents per barrel of gasoline. The company could not produce enough oil from its own leases to supply the refinery, he said, and to buy it at the posted price meant a loss of money. Mr. Dye recommended that the Oklahoma City Field, which he blamed for the present potential overproduction, be shut down for six months and that companies be permitted to voluntarily curtail production in other pools.

J. R. Travis of Duncan, Okla., owner of a pipe line connected to 179 wells in that area and a refinery operating in the Duncan district, occupied most of Tuesday afternoon in his testimony. He said the present price of crude oil and the prices at which he must sell his refined products are so far out of line that he is losing from 30 to 40 cents per barrel on his finished product. He gave it as his opinion that the whole proration program has as its object the fixing of crude prices. As long as the price of oil is high, it makes it possible to finance new drilling, he said. Not until the drilling of wells is stopped will conditions be bettered, in his opinion. He believes the only remedy is to lift all proration orders, let the industry take care of itself, and in seven months' time it will return to normalcy. He believes a very low price of oil will result if proration were lifted and that this would stop the drilling of wells and would put a stop also to the steadily increasing potential production. Proration, he said, was only prolonging the agony.

DISCONTINUE POSTING SAGINAW, MICH., CRUDE

MUSKEGON, Mich., Oct. 14.—Purchase of crude oil in the Saginaw Field has been discontinued by the Sun Oil Co. Daily production has dwindled to about 250 bbls. The Sun has been purchasing about 90 bbls. a day from other operators.

The Standard Oil Co. of Indiana, operating the other gathering line is putting about 120 bbls. a day into storage since operations of a 1,500-bbl. skimming plant at Zilwaukee, Mich., near Saginaw, were discontinued in August.

Late Fields

(Continued from Page 40)

ing to cement the 8-inch casing at 4,918 feet and it is expected to be several days before a production test can be made.

Magnolia Petroleum Co.'s No. 1 Wood, NE cor. SW, Section 29-6-6, an extension well in the Konawa Pool, in southern Seminole County, is flowing 56 bbls. every 25 minutes. The well is averaging 132 bbls. per hour. It flowed 3,217 bbls. in 24 hours. The sand was found from 2,800-10 feet. The well extends production a quarter of a mile south in the south end of the pool and indicates another producing area in the Greater Seminole district.

Mid-Kansas Oil & Gas Co.'s No. 1 Messer, SW cor., Section 32-14-3w, a wildcat north of the Oklahoma City Pool, made 355 bbls. October 12 and 295 bbls. October 13, and 426 bbls. October 14. The crew was still cleaning out after the second shot in the Wilcox sand at 6,697-6,771 feet.

The Cromwell-Franklin Oil Co.'s No. 31 Trosper Park, NW cor. NE SW, Section 12-11-3w, is the twenty-ninth producer completed on the city-owned property. It flowed 3,057 bbls. the first eight hours. The gas volume was estimated at 7,000,000 feet.

The wildcat test of the Prairie Oil & Gas Co. and Tom Slick Oil Co., No. 1 Dills, SE cor. NW, Section 17-13-3w, was plugged back to 6,220 feet and was bailing salt water and testing. The owners plan to plug it back and test it again. The casing was ripped at 5,818-40 feet and it will be tested at that depth.

G. D. Warr and others' No. 1 Castle, SW cor. NW, Section 20-11-3w, another wildcat west of production in the Oklahoma City Field, was reaming to a total depth of 6,422 feet prior to landing the 6-inch casing. The test has been shut down for several weeks.

Mid-Continent Petroleum Corp.'s No. 2 Tiger, SE cor. SW NE, Section 9-7-8, Seminole County, was opened for a production test and made 120 bbls. in two and one-half hours. The gas volume was estimated at 15,750,000 feet.

Blackwell Oil & Gas Co.'s No. 1 in the SE cor. NW SE, Section 28-17-4, Lincoln County, found 14,000,000 feet of gas in sand at 4,334-94 feet and it is believed has opened another producing area in the county. The test was a semi-wildcat one and is in an area with several other producing pools.

The actual production from the Oklahoma City Pool for the past seven days was as follows:

Date—	Bbls.	Wells prod.	Wells comp.
October 8	101,170	62	593
October 9	86,420	73	596
October 10	81,155	57	597
October 11	83,806	53	597
October 12	89,751	59	598
October 13	77,588	43	599
October 14	89,288	57	603

EAST CENTRAL TEXAS

FORT WORTH, Tex., Oct. 14.—M. Joiner's No. 1 Bradford in the Juan Ximenes Survey, Central Rusk County, new Woodbine sand discovery, flowed 365 bbls. in 15 hours after tubing was rerun with packer.

SERVICE A FACTOR IN PATENT SUIT DECISION

Federal Judge Pollock of Kansas, sitting in the federal district court of Oklahoma, has rendered a decision upholding the cementing patents of Erle P. Halliburton in the suit of the Halliburton Oil Well Cementing Co. against both the Independent Oil Well Cementing Co. and the Universal Oil Well Cementing Co.

These latter companies have been operating in the Oklahoma City oil field and the Halliburton company has contended that these companies were not contributing anything constructive to the cementing industry and in fact were using the ideas of others, merely aiming to skim some of the cream in a busy field instead of rendering service in other quiet fields where there are no profits. The Halliburton company is said to have rendered service in all fields regardless of the volume of business.

OREGON BASIN DECISION

WASHINGTON, D. C., Oct. 13.—The Supreme Court today refused to pass on the authority of the Secretary of the Interior to fix the minimum price at which oil taken under lease from government land may be sold.

In July, 1928, the secretary announced the government royalty on oil produced in the Oregon Basin Field would be based on a minimum price of 85 cents a barrel. The Cody Petroleum Co. had contracted to sell its oil to The Texas Company at the wells at 53 cents a barrel and was prohibited by the secretary from selling at less than 85 cents. The Texas Company sought to enjoin the Government from fixing the minimum price but the secretary was sustained by the Court of Appeals of the District of Columbia.

BILL TO CONTROL GAS LINE

TOPEKA, Kans., Oct. 13.—A bill definitely placing natural gas pipe lines under the jurisdiction of the Interstate Commerce Commission will be introduced at the coming session of Congress by Senator Arthur Capper.

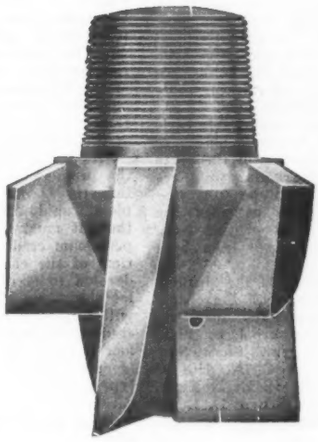
Senator Capper announced today his intention of sponsoring the control bill. He said also he would urge the appointment of a subcommittee of the Senate committee on interstate commerce to conduct hearings this winter. Public hearings on rates and other phases of the gas pipe line business will establish a basis for future control.

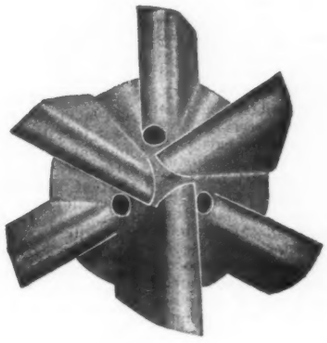
BACK FROM ABROAD

H. F. Sinclair has returned from a visit of several months' duration to Europe.

COLON PRODUCTION

Production of Colon Oil Corp.'s subsidiary in Venezuela for the week ended October 3 was 105,538 bbls.





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Of Interest to Sales Departments

Tire Marketing to Result in Changed Conditions in West

LOS ANGELES, Calif., Oct. 11.—Although no announcement has been made up to the present time, it is the general consensus of opinion that the Standard Oil Co. of California will soon begin merchandising automobile tires at all of its service stations on the Pacific Coast. Initial steps along this line are expected to be taken in the near future and this feature, together with the present convenience of filing telegrams in Standard Oil Co. stations for transmittal, may force other major concerns to adopt a similar policy. In order to adopt this new method of marketing, the Standard is working out a plan which will centralize all of its service stations under one head, which presumably will be a subsidiary company. This procedure is necessary because of the fact that Standard, along with some of the other major concerns on the Pacific Coast, divorced itself of its service stations about two years or so ago. The Union leased out its stations to individuals or service station operators who were at that time in the employ of the company.

The Standard turned over a number of its service stations to individuals and another block to the Southern Gasoline Stations, Inc., and Northern Gasoline Stations, Inc. The Shell leased out its stations to Van Fleet & Durkee, the principals of which were previously in the employ of the General Petroleum. This change in marketing practice was made at that time on the assumption that private operation would prove more advantageous as this method of operation made it possible to capitalize on the initiative and personality of station operators who would maintain longer hours and go out after business instead of waiting for business to come in. Gasoline price wars and the inability to maintain stabilized quotations, however, subsequently voided the advantages which would naturally accrue to private operation.

When this plan first started, the marketing companies sold gasoline to these stations at a regularly established tank wagon price. This caused considerable difficulty at a later date because of the tendency on the part of service station operators to cut prices when the refining companies indicated they were only interested in the tank wagon price and that it was up to service station operators to get the best retail price possible. Van Fleet and Durkee, operating Shell Oil Co. service stations, have been carrying a line of tires and accessories for more than a year with good success. It remains to be seen, however, just how this new method will work when all of the major companies begin accepting telegrams and merchandising tires and accessories. This will be especially interesting because of the highly competitive conditions existing on the Pacific Coast.

MAY INCREASE TAX

WASHINGTON, D. C., Oct. 11.—The District of Columbia has a budget aggregating $45,000,000 for the coming fiscal year and in stress because of a lack of sufficient income is looking to doubling the gasoline tax now 2 cents per gallon in order to overcome the difficulty.

The gasoline tax in the District of Columbia was originally adopted to supplement funds available for highway construction. The tax was so easily collected that officials here have been tempted to raise it to 4 cents a gallon to pay expenses other than highway construction. Should the tax be increased to 4 cents a gallon, the tax would amount to 34.1 per cent on the cost of the gasoline.

OHIO'S CODE COMMITTEE EXPEDITES ENFORCEMENT

Established and efficient business procedure is followed by the Ohio Code Committee in handling complaints of alleged violations of the National Code of Practices for Marketing Refined Petroleum Products.

Only formal, written complaints, filed by signers of the code, are considered by the committee. Every effort is made to effect an adjustment, but if this is found to be impossible parties to the complaint are asked to appear before the committee. In virtually every case the committee has been able to bring about an amicable adjustment.

The committee holds it the duty of every signer of the code to report any violations of which he has knowledge, in writing, with a specific charge outlining how the code has been violated and sufficient evidence to allow the committee to investigate. To facilitate and make uniform the filing of complaints, the committee issues printed forms in triplicate. One copy is kept by the complainant. The others are forwarded to the secretary, who files one and forwards the third to the party complained against.

The forms contain provision for the complete name and address of both parties, and for complete details, the complainant being asked to give dates, names and a clear statement of the case.

OIL BURNER SALES LESS

WASHINGTON, D. C., Oct. 11.—Fifty manufacturers of oil burners whose output constitutes 60 per cent of the total for the industry in 1927 shipped 7,918 oil burners as compared with 7,241 in July and 10,653 in August, 1929. During eight months ending with August, these manufacturers received orders for 41,006 oil burners, and shipped 39,956, of which 38,915 were for points in the United States, 254 were for Canada and 787 were shipped abroad.

These figures compare with 45,241 new orders in the same period of 1929 within the United States, 554 to Canada and 790 to foreign ports. Of the new orders received in August, numbering 7,892, mechanical draft domestic burners numbered 6,726, and natural draft 726.

BUYS LONDON COMPANY

It is reported that Trinidad Leaseholds, Ltd., one of the principal British companies operating in Trinidad, has purchased the gasoline distributing business of Burt, Boulton & Heywood, Ltd., of London. It is understood that Trinidad Leaseholds has heretofore marketed its products chiefly in Trinidad, but has decided to extend operations on account of diminished trading profits.

UNION'S KEROSENE PLANT

LOS ANGELES, Calif., Oct. 11.—The new kerosene plant of the Union Oil Co. at its Wilmington, Calif. refinery will be completed about December 1. The plant will have a capacity of 6,000 bbls. daily. This is double the original capacity which the company intended to build and accounts for the delay in completing the plant. The plant is Edeleanu type.

HEAVY CHINESE TAX

The Hongkong government has placed in effect a tax of 15 Hongkong cents per imperial gallon on all gasoline and light hydrocarbon oils consumed in the colony. The Hongkong dollar at present rates of exchange is equal to approximately 32 cents, United States currency.

TEXAS OIL MARKETERS TO MEET IN MINERAL WELLS

The second annual convention of the Texas Petroleum Marketers Association and a meeting of the State A.P.I. Code Committee will be held jointly at the Baker Hotel, Mineral Wells, Tex., on Thursday and Friday, October 23 and 24.

This statewide meeting will be a business conference for the executives of large and small petroleum marketing companies. A day and a half will be devoted to practical discussion of perplexing problems confronting the oil industry.

All members of the State A.P.I. Code Committee, district chairmen and vice chairmen from every section of the State will be present, and marketing practices under this instrument will be fully discussed. Those who have attended the monthly regional meetings of this committee state that they have been benefited.

Paul Hadlick, secretary of the Marketing Division of the American Petroleum Institute, will be among the speakers. Officers of the association are J. B. Russ, Houston, president; Grover C. Shaw, San Antonio, vice president; C. N. Dillon, Amarillo, vice president; C. M. McNutt, El Paso, vice president; George D. Bowers, Dallas, vice president; W. C. Gaylor, Houston, treasurer; Chester A. Slimp, San Antonio, secretary; L. H. Flinn, managing director-counsel.

DISSOLVE GERMAN CARTEL

WASHINGTON, D. C., Oct. 11.—The German gasoline cartel was dissolved September 27 as the result of "independents" quoting lower prices on oil imported from America, Russia and Rumania, according to cable advice received at the Department of Commerce today. It has been known for some time that consumers of gasoline in Germany have protested against the gasoline cartel as a means of equalizing and stabilizing prices and have sought importations by outside companies to break what they have regarded as a monopolistic industry.

When "independent" began flowing into Germany recently the business of the cartel was underbid and it became necessary for its members to operate unhampered to meet competition to retain their trade in individual cases. There was nothing to do except disband the cartel. The retail price at tank stations in Berlin on September 29 was 34 pfennigs per liter, a drop of from 1 to 2 pfennigs per liter.

NAVY AWARDS CONTRACTS

NEW YORK, Oct. 11.—Contracts aggregating 3,514,350 gallons of gasoline for delivery from November 1, 1930, to April 30, 1931, have been awarded by the bureau of supplies and accounts of the Navy Department.

Successful bidders and the gallonage allotted each follow: Oleander Oil Co., 57,000 gallons; Standard Oil Co. of Ohio, 20,000 gallons; Continental Oil Co., 70,000 gallons; Standard Oil Co. of New York, 498,000 gallons; Sinclair Refining Co., 171,750 gallons; Colonial Beacon Oil Co., 35,000 gallons; Standard Oil Co. of Louisiana, 17,500 gallons; Soo Oil Co., 27,500 gallons; Sherrill Oil Co., 350,000 gallons; Standard Oil Co. of Kentucky, 42,500 gallons; Gulf Refining Co., 8,500 gallons; Standard Oil Co. of Pennsylvania, 75,000 gallons; Standard Oil Co. of New Jersey, 1,040,000 gallons; The Texas Company, 1,101,600 gallons.

This gasoline will be used by the coast guard, lighthouse service, coast and geodetic survey, bureau of navigation of the Department of Commerce. Connecticut naval militia, and army district engineers at Savannah, Ga., Charleston, S. C., and Wilmington, N. C.

Credit Men to Hold Annual Meeting in St. Louis Next Week

The annual conference of the Petroleum Refiners Division, National Association of Credit Men, to be held at the Coronado Hotel, St. Louis, Mo., on October 20, 21 and 22, promises to be the most instructive meeting that organization has held, according to W. Z. Brown of the Producers & Refiners Corp., Independence, Kans., who is chairman of the Board of Governors and who will preside at the sessions of the conference.

"As is true in other lines of business, the problem of credits in the petroleum industry is steadily growing more complex," said Mr. Brown, "and greater thought must be given to all phases of petroleum credit. In previous years, the time of the conference has largely been devoted to credits as they relate to car lot shipments. This year the conference will interest itself in not only tank car credits, but will also cover the questions met in handling all products to everyone from the oil jobber to the farmer. Each type of customer and each class of product creates a different problem, and the work of the conference will be to determine the methods and practices which give the best results."

Considerable stress will be laid on the feature of service—not as applied to the mechanics of distribution, but to service as it relates to helping customers in establishing records and figures which will help the customer in establishing his costs of doing business, the ratio of volume and sales which will produce the greatest profit for him, as well as providing him with simple but adequate records of his operations.

Among other matters, consideration will be given to "How the Credit Department Can Become a Profitable Sales Adjunct of the Business"; "Credit Problems Growing Out of Service Station Sales, Cost of Handling Charge Accounts and Determining Their Profitableness"; "Credit as It Relates to Furnace and Fuel Oil," which is rapidly becoming an important factor to the petroleum industry; "The Effect of Credit and Terms Competition Upon the Buyer, Seller and Production and Distribution Within the Industry." Special attention will be given to the question of the best methods of developing impartial and dependable credit information on all classes of customers.

Conferences of previous years have covered two days. Because of the number of new features to be included this year, an extra day will be required. The annual banquet will be held on Tuesday evening. Special entertainment, and a talk on "Present Business Conditions and the Outlook for the Coming Year," by Arthur F. Barnes, vice president, Mercantile-Commerce Bank & Trust Co., St. Louis, Mo., will be the features.

GRANT TRADE-MARK

NEW YORK, Oct. 11.—The Commissioner of Patents, at Washington, D. C., has granted to Jiles R. Travis of Duncan, Okla., registry of the word "Benz-o-lite" as a trade-mark for gasoline.

This registry was granted over the protest of Sherwood Brothers of Baltimore, who contended that "Benz-o-lite" as a trade-mark for gasoline conflicted with their registered mark "Betholine."

SOUTH AMERICAN MOTORING

"It is safe to predict that within 5 to 10 years motorists will be able to tour most of Mexico, Central and South America over good highways," said Richard S. Turner at the Pan American Reciprocal Trade Conference at Sacramento.

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NAPHTHA—GAS—OILS—
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New York Harbor (Bayonne, N. J.)
Jacksonville, Fla.
Port Tampa, Fla.
Mobile (Magazine Point, Ala.)
Philadelphia (Girard Point, Pa.)
Charleston, S. C.
Savannah, Ga.
New Orleans (Gretna, La.)
Port Arthur, Texas.
Galveston, Texas

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The Layne & Bowler Corp. Los Angeles, Calif.
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BUREAU OF MINES PETROLEUM STATISTICS FOR MONTH OF AUGUST

SUPPLY AND DEMAND OF ALL OILS

(Including wax, coke and asphalt in thousands of barrels of 42 U. S. gallons)

NEW SUPPLY:	August, 1930	July, 1930	August, 1929	Jan.-August, 1930	Jan.-August, 1929
Domestic production:					
Crude petroleum*	74,853	76,554	93,165	617,432	671,765
Daily average	2,415	2,469	2,973	2,541	2,764
Natural gasoline	4,212	4,231	4,507	34,895	33,824
Benzol	216	224	264	1,913	2,054
Total production	79,281	81,009	96,936	654,241	707,643
Daily average	2,557	2,613	3,127	2,692	2,912
Imports:					
Crude petroleum	5,059	5,877	5,800	42,066	55,774
Refined products	4,329	4,040	3,430	29,956	17,679
Total new supply, all oils	88,669	90,926	106,166	726,263	781,096
Daily average	2,860	2,933	3,425	2,989	3,214
Increase in stocks, all oils	†7,030	†4,442	4,872	†3,309	57,663
DEMAND:					
Total demand	95,699	95,368	101,294	729,572	723,433
Daily average	3,087	3,076	3,268	3,002	2,977
Exports:					
Crude petroleum	2,407	1,973	2,236	16,474	16,876
Refined products	12,567	11,041	12,771	94,899	91,279
Domestic demand	80,725	82,354	86,287	618,199	615,278
Daily average	2,604	2,657	2,783	2,544	2,532
Excess of daily average domestic production over domestic demand	†47	‡44	344	148	380
Stocks (end of month):					
Crude petroleum:§					
East of California	381,640	384,514	392,684	381,640	392,684
California¶	144,372	145,621	146,298	144,372	146,298
Total crude	526,012	530,135	538,982	526,012	538,982
Natural gasoline at plants	744	741	893	744	893
Refined products	159,101	162,011	138,798	159,101	138,798
Grand total stocks, all oils	685,857	692,887	678,673	685,857	678,673
Days' supply	222	225	208	228	228
Bunker oil (included above in domestic demand)	4,702	4,316	4,734	34,315	35,104

*Beginning with this issue, "crude production" will represent actual production, that is, oil gathered on the leases plus or minus the change in producers' stocks plus crude consumed as fuel on the leases. These items are included in the data for 1929 which are final. †Decrease. ‡Deficiency. §Includes producers' stocks. ¶Includes residual fuel oil.

COMPARATIVE ANALYSES

(Thousands of barrels of 42 U. S. gallons)

	August, 1930		July, 1930		Jan.-August, 1930	Jan.-August, 1929
CRUDE PETROLEUM:	Total	Daily av.	Total	Daily av.		
Runs to stills: Domestic	73,655	2,376	73,239	2,363	594,475	600,518
Foreign	5,634	182	5,405	174	41,115	52,977
Total	79,289	2,558	78,644	2,537	635,590	653,495
Imports	5,059	163	5,877	190	42,066	55,774
Exports	2,407	78	1,973	64	16,474	16,876
GASOLINE:						
Production*	37,844	1,221	38,061	1,223	299,222	286,108
Imports	1,827	59	1,741	56	11,726	5,207
Exports	6,691	216	5,694	184	47,193	41,296
Stocks†	41,624	....	46,077	....	41,624	33,795
Domestic demand	37,433	1,208	38,256	1,234	265,392	249,316
KEROSENE:						
Production	3,975	128	3,929	127	34,321	36,606
Imports	2	....	5	....	127	144
Exports	1,693	55	1,034	33	11,587	13,665
Stocks	8,030	....	8,319	....	8,030	8,394
Domestic demand	2,573	83	2,932	95	23,626	23,692
GAS OIL AND DISTILLATE FUELS:						
Production	6,831	220	6,726	217	53,117	.....
Stocks	18,332	....	17,380	....	18,332	.....
RESIDUAL FUEL OILS:						
Production	23,031	743	24,297	784	201,566	.....
Stocks‡	21,397	....	21,747	....	21,397	.....
GAS OIL AND FUEL OIL:						
Production	29,862	963	31,023	1,001	254,683	299,870
Imports	2,489	80	2,286	74	17,872	12,197
Exports	3,057	99	3,095	100	25,976	25,649
Stocks	39,729	....	39,127	....	39,729	39,316
LUBRICANTS:						
Production	2,971	96	3,018	97	24,014	23,302
Imports	3	....	2	....	18	29
Exports	826	27	922	30	7,096	7,591
Stocks	10,161	....	9,953	....	10,161	7,478
Domestic demand	1,940	63	1,887	61	15,044	16,602
WAX (thousands of pounds):						
Production	39,760	1,283	45,640	1,472	393,680	429,305
Imports	1,677	54	1,394	45	19,050	27,214
Exports	23,697	764	20,391	658	179,737	195,170
Stocks	254,990	....	254,999	....	254,990	194,649
Domestic demand	17,749	573	21,392	690	167,595	179,254
COKE (short tons):						
Production	172,100	5,552	161,200	5,200	1,263,000	1,161,200
Stocks	994,200	....	941,900	....	994,200	672,400
ASPHALT (short tons):						
Production	345,600	11,148	333,500	10,758	2,208,000	2,313,400
Stocks	315,800	....	310,700	....	315,800	246,800
ROAD OIL:						
Production	816	26	809	26	4,005	6,960
Stocks	415	....	384	....	415	
MISCELLANEOUS:						
Production	867	28	901	29	4,962	742
Stocks	488	....	467	....	488	

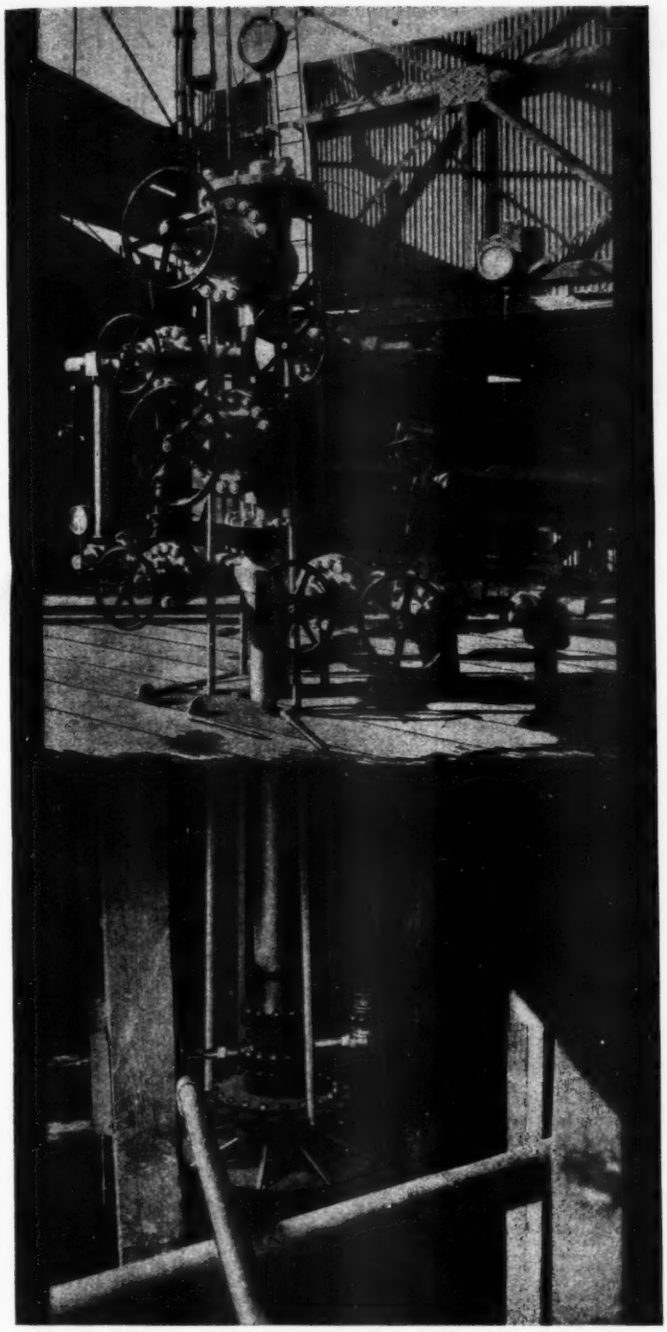
*Includes benzol production and natural gasoline used elsewhere than at refineries east of California. †Includes motor fuel blends held at natural gasoline plants. ‡East of California.

RECORD OF WELLS FOR IMPORTANT FLUSH FIELDS, AUGUST, 1930*

	Completions—Oil	Gas	Dry	Total initial production (bbls.)	Average initial production (bbls.)	Drilling Aug. 31
Texas	366	56	325	256,800	700	973
Darst Creek	11	..	4	7,200	700	2
West Texas	49	..	27	55,700	1,100	201
California	59	..	22	53,100	900	433
Long Beach	15	..	..	10,800	700	83
Playa Del Rey	11	..	..	10,900	1,000	60
Santa Fe Springs	2	..	..	400	200	4
Oklahoma	177	30	85	730,700	4,100	707
Oklahoma County	66	..	1	648,300	9,800	306
Seminole District	35	1	17	40,400	1,100	55
New Mexico	15	..	3	123,100	8,200	110
Lea County (Hobbs)	14	..	3	123,000	8,800	82
Other states	375	209	247	35,900	100	1,465
Total United States	992	295	682	1,189,600	1,200	3,688

*From The Oil and Gas Journal and California office of American Petroleum Institute.

(Continued on Next Page)



View of a high-pressure installation recently made at Kettleman Hills. This installation consists of 6000-lb. test equipment, including Regan T.B. & R. control head, Regan tubing head, Christmas tree fittings and high-pressure gate valves.

The HIGHEST PRESSURES ARE Regan-controlled

Ask for new Regan Control Head Bulletin No. 50.

Regan Type C equipment is designed for high pressures regardless of size, each part being individually tested to 6,000 lbs. Our facilities provide for testing this equipment completely assembled, including Christmas tree and valves. Bolting and flanges are built to A.E.S.C. 1350 Series, with all other portions built into proportion.

The illustration to the right shows one of many hook-up combinations possible with Types A, B or C Regan Control Equipment, and consists of three strings of casing suspended from the casing head, using high tensile long thread Santa Fe couplings, the largest string of casing being suspended from a landing base. A special extra-heavy four-way fitting is inserted between the extra-heavy hydraulic pipe riser and the casing head. The tubing head is extra-large in size to accommodate casing used in place of tubing. The tubing head body is of special construction and is provided with extra-heavy male vents.

A complete hook-up with the Christmas tree adapts itself to high volume production as well as high pressure and provides three sets of flow lines, the two lower sets being for gas take-off. The use of a heavy plate above the tree, in combination with the landing base, provides for the use of extra-heavy tie bolts.

Regan
Forge & Engineering Co.
Oil Field Equipment
Plant and General Offices:
SAN PEDRO (Los Angeles Harbor) CALIFORNIA, U. S. A.

New York Office:
75 West Street
Wm. Braat, Manager

Mid-Continent Office:
Dallas, Texas
501-2 Marvin Building

Representatives:

Oklahoma City, Okla.
2420 W. 21st St.

Pecos, Texas
P.O. Box 444

Maracaibo, Venezuela
Wm. Adams, care Amer. Consul

PRODUCTION OF CRUDE PETROLEUM BY STATES*

(Thousands of barrels of 42 U. S. gallons)

	August, 1930		July, 1930		Jan.-August,	Jan.-August,
	Total	Daily av.	Total	Daily av.	1930	1929
Arkansas	1,638	53	1,695	55	13,392	17,394
California:						
Long Beach	3,203	104	3,104	100	24,713	43,632
Santa Fe Springs	3,376	109	3,478	112	32,777	49,700
Rest of state	12,191	393	12,220	394	98,485	103,130
Total California	18,770	606	18,802	606	155,975	196,462
Colorado	133	4	141	4	1,123	1,663
Illinois	520	17	527	17	4,091	4,225
Indiana:						
Southwestern	87	3	88	3	665	613
Northeastern	4	....	5	....	36	43
Total Indiana	91	3	93	3	701	656
Kansas	3,448	111	3,583	116	28,284	28,258
Kentucky	608	20	671	22	5,064	4,803
Louisiana:						
Gulf Coast	787	26	773	25	5,244	4,889
Rest of state	1,215	39	1,237	40	9,657	8,449
Total Louisiana	2,002	65	2,010	65	14,901	13,338
Michigan	212	7	279	9	2,569	2,638
Montana	306	10	300	10	2,102	2,686
New Mexico	1,276	41	1,344	43	5,319	813
New York	244	8	276	9	2,629	2,211
Ohio:						
Central and east	405	13	459	15	3,561	3,508
Northwestern	103	3	121	4	911	1,020
Total Ohio	508	16	580	19	4,472	4,528
Oklahoma:						
Osage County	.....	....	1,071	34	.....	10,261
Oklahoma City	2,583	83	2,829	91	22,366	2,588
Seminole	5,046	163	5,979	193	57,048	95,425
Rest of state	...	....	7,901	255	.....	65,003
Total Oklahoma	16,962	547	17,780	573	151,720	173,277
Pennsylvania	875	28	947	31	9,047	7,565
Tennessee	3	....	3	....	12	15
Texas:						
Gulf Coast	5,252	169	5,361	173	42,098	31,356
West Texas	8,889	287	9,096	293	76,510	89,704
Rest of state	11,243	363	11,183	361	81,929	73,721
Total Texas	25,384	819	25,640	827	200,537	194,781
West Virginia	356	11	446	14	3,565	3,695
Wyoming:						
Salt Creek	875	28	872	28	7,103	7,535
Rest of State	642	21	565	18	4,827	5,211
Total Wyoming	1,517	49	1,437	46	11,930	12,746
United States total	74,853	2,415	76,554	2,469	617,433	†671,765

*Beginning with this issue, "crude production" will represent actual production, that is, oil gathered on the leases plus or minus the change in producers' stocks plus crude consumed as fuel on the leases. These items are included in the data for 1929 which are final. †Includes 5,000 bbls.—Alaska and Utah.

PRODUCTION OF CRUDE PETROLEUM BY FIELDS

(Thousands of barrels of 42 U. S. gallons)

	August, 1930		July, 1930		Jan.-August,	Jan.-August,
FIELD:	Total	Daily av.	Total	Daily av.	1930	1929
Appalachian:						
Pennsylvania grade	1,681	54	1,917	62	17,203	15,448
Other (including Kentucky)	810	26	885	29	6,675	6,355
Lima, Northeast Indiana, Michigan	319	10	405	13	3,516	3,761
Illinois, Southwest Indiana	607	20	615	20	4,756	4,838
Mid-Continent:						
North Louisiana and Arkansas	2,853	92	2,932	95	23,949	25,843
West Texas, Southeast New Mexico	10,110	326	10,382	334	81,427	90,183
Other (Oklahoma, Kansas, North Texas, etc.)	31,653	1,021	32,546	1,050	261,933	275,256
Gulf Coast:						
Grade A	2,705	87	2,770	89	22,143	36,245
Grade B	3,334	108	3,364	109	25,199	
Rocky Mountain	2,011	65	1,936	62	15,557	*17,434
California	18,770	606	18,802	606	155,975	196,462
Total	74,853	2,415	76,554	2,469	617,433	671,765
CLASSIFICATION BY GRAVITY (approx.):						
Light crude	66,064	2,131	67,694	2,183	545,669	605,023
Heavy crude	8,789	284	8,860	286	71,764	66,712

*Includes 5,000 bbls.—Alaska and Utah.

INDICATED DOMESTIC DEMAND FOR CRUDE PETROLEUM, EAST OF CALIFORNIA

(Thousands of barrels of 42 U. S. gallons)

Domestic petroleum by fields of origin:	August, 1930		July, 1930		Jan.-August,	Jan.-August,
	Total	Daily av.	Total	Daily av.	1930	1929
Appalachian:						
Pennsylvania grade	2,028	68	1,887	61	15,869	21,975
Other (including Kentucky)	833	27	922	30	6,683	
Lima, N. E. Indiana, Michigan	128	4	178	6	2,719	4,201
Illinois, Southwest Indiana	579	18	500	16	4,996	5,599
Mid-Continent:						
North Louisiana and Arkansas	2,803	90	3,203	103	23,615	379,331
West Texas, S. E. New Mexico	10,666	344	10,441	337	86,494	
Other (Oklahoma, Kansas, N. Texas, etc.)	33,081	1,067	32,054	1,034	260,817	
Gulf Coast:						
Grade A	3,194	103	2,458	79	23,423	33,879
Grade B	3,168	102	3,628	117	25,209	
Rocky Mountain	1,968	63	1,971	64	16,023	18,884
California	14	....	36	1	185	.....
Total demand	58,462	1,886	57,278	1,848	466,033	463,869
Exports	1,675	54	1,396	45	10,561	11,573
Domestic demand	56,787	1,832	55,882	1,803	455,472	452,296
Foreign petroleum	5,568	180	6,070	195	43,388	55,867
Total domestic demand east of California	62,355	2,012	61,952	1,998	498,860	508,163

PRODUCTION AND DISTRIBUTION OF NATURAL GASOLINE

(Thousands of barrels of 42 U. S. gallons)

	August, 1930		July, 1930		Jan.-Aug., 1930	
	Total	Dly. av.	Total	Dly. av.	Total	Dly. av.
Production	4,212	136	4,231	137	34,895	144
Decrease in all stocks	182	6	225	7	.....	....
Total	4,394	142	4,456	144	34,895	144
Blended at refineries	3,915	126	4,070	132	29,329	121
Run through pipe lines in California	97	3	105	3	1,344	5
Blended at plants*	18	1	22	1	185	1
Sold direct to jobbers	200	6	150	5	1,650	7
Increase in all stocks	....	....	....	....	516	2
Balance	164	6	109	3	1,871	8
Total	4,394	142	4,456	144	34,895	144

*East of California.

STOCKS OF CRUDE PETROLEUM

(Thousands of barrels of 42 U. S. gallons)

EAST OF CALIFORNIA:	Aug. 31, 1930	July 31, 1930	Aug. 31, 1929
At refineries by location:			
East Coast: Domestic	10,969	10,227	9,221
Foreign*	3,706	4,198	4,437
Appalachian	2,857	2,977	2,697
Indiana, Illinois, Kentucky, Michigan, etc.	3,199	3,150	2,834
Oklahoma, Kansas and Missouri	5,283	5,372	6,475
Texas: Inland	2,144	2,282	1,719
Gulf Coast: Domestic	9,455	9,752	10,161
Foreign*	338	219	471
Arkansas and inland Louisiana	1,112	1,105	1,468
Louisiana Gulf Coast: Domestic	5,314	5,432	4,104
Foreign	719	855	1,469
Rocky Mountain	1,689	1,571	1,811
Total	46,785	47,140	47,164
At refineries by origin:			
Pennsylvania grade	2,679	2,737	(†)
Other Appalachian (including Kentucky)	877	842	(†)
Lima, Northeast Indiana, Michigan	148	118	(†)
Illinois, Southwest Indiana	127	122	(†)
North Louisiana and Arkansas	4,851	4,880	(†)
West Texas and Southeast New Mexico	5,286	5,166	(†)
Oklahoma, Kansas, North Texas, etc	18,833	19,047	(†)
Gulf Coast: Grade A	4,323	4,336	(†)
Grade B	3,209	3,050	(†)
Rocky Mountain	1,688	1,569	(†)
California	1	1	(†)
Foreign*	4,763	5,272	6,377
Total	46,785	47,140	47,164
Pipe line and tank farm:			
Pennsylvania grade	5,823	6,112	4,518
Other Appalachian (including Kentucky)	908	966	789
Lima, Northeast Indiana, Michigan	1,457	1,294	637
Illinois, Southwest Indiana	10,286	10,256	10,598
North Louisiana and Arkansas	21,423	21,343	22,867
West Texas and Southeast New Mexico	47,764	48,477	254,638
Oklahoma, Kansas, North Texas, etc	197,629	199,039	
Gulf Coast: Grade A	7,561	8,041	20,497
Grade B	11,332	11,328	
Rocky Mountain	24,172	24,268	24,476
Total	328,355	331,124	339,050
Total refinery, pipe line and tank farm	375,140	378,264	386,214
Producers'	6,500	6,250	6,470
Total crude east of California	381,640	384,514	392,684
CLASSIFICATION BY GRAVITY (approx.):			
East of California: Light	338,582	339,763	344,265
Heavy	36,558	38,501	41,949
California: Light	40,671	41,071	37,853
Heavy (including fuel)	103,701	104,550	108,445

*Includes importers' stocks. †Not available.

IMPORTS AND EXPORTS OF CRUDE PETROLEUM AND MAJOR REFINED PRODUCTS*

(Thousands of barrels of 42 U. S. gallons)

	August, 1930		July, 1930		Jan.-August,	Jan.-August,
CRUDE PETROLEUM:	Total	Daily av.	Total	Daily av.	1930	1929
Imports	5,059	163	5,877	190	42,066	55,774
From Mexico	1,271	41	1,246	40	6,496	8,596
From Venezuela	2,332	75	3,531	114	24,531	36,850
From Colombia	1,176	38	987	32	9,327	8,068
From other countries	280	9	113	4	1,712	2,260
Exports:						
Domestic crude oil	2,407	78	1,973	64	16,474	16,876
To Canada	1,935	63	1,643	53	12,993	14,158
To other countries	472	15	330	11	3,480	2,711
Shipments	....	....	....	....	1	7
Foreign crude oil	....	....	....	....	.....	.....
REFINED PRODUCTS:						
Gasoline:						
Imports	1,827	59	1,741	56	11,726	5,207
Exports†	6,691	216	5,694	184	47,193	41,296
To United Kingdom	2,035	66	1,720	55	14,364	11,856
To France	934	30	734	24	6,668	5,837
To Canada	578	19	500	16	2,894	3,465
To other countries	3,076	99	2,653	86	22,490	19,298
Shipments	68	2	87	3	777	842
Kerosene:						
Exports	1,693	55	1,034	33	11,887	13,665
To China	327	11	321	10	1,919	2,470
To United Kingdom	415	13	169	6	1,931	1,849
To other countries	945	31	531	17	7,851	9,185
Shipments	6	....	13	....	186	161
Gas oil and fuel oil:						
Imports	2,489	80	2,286	74	17,872	12,197
Exports	3,057	99	3,095	100	25,976	25,619
To Chile	299	10	305	10	2,957	3,925
To Panama	391	13	292	9	2,140	2,125
To other countries	1,878	60	2,257	73	17,962	17,331
Shipments	489	16	241	8	2,917	2,264
Lubricants:						
Exports	826	27	922	30	7,096	7,591
To United Kingdom	207	7	142	5	1,445	1,352
To France	159	5	159	5	1,097	1,146
To other countries	453	15	615	20	4,494	5,048
Shipments	7	....	6	....	60	65
Wax (thousands of pounds):						
Imports	1,677	54	1,394	45	19,050	27,214
Exports	23,697	764	20,391	658	179,737	195,170
To United Kingdom	6,599	213	6,902	223	46,445	45,396
To Italy	4,626	149	985	32	24,462	17,619
To other countries	12,470	402	12,502	403	108,813	132,123
Shipments	2	....	2	....	17	35

*From Bureau of Foreign and Domestic Commerce. †Includes benzol.

PRODUCTION OF MOTOR FUEL

(Thousands of barrels of 42 U. S. gallons)

Gasoline produced at refineries:	August, 1930		July, 1930		Jan. Aug.,	Jan.-Aug.,
	Total	Dly. av.	Total	Dly. av.	1930	1929
Straightrun	18,932	611	19,404	626	156,138	163,166
Cracked	14,465	467	14,086	454	108,663	90,778
Natural gasoline:						
Blended at refineries	3,915	126	4,070	132	29,329	27,628
Run through pipe lines*	97	3	105	3	1,344	1,618
Total	37,410	1,207	37,665	1,213	295,474	283,190
Other natural gasoline:						
Blended at plants†	18	1	22	1	185	464
Sold direct to jobbers	200	6	150	5	1,650	400
Benzol produced‡	216	7	224	7	1,913	2,054
Total motor fuel	37,844	1,221	38,061	1,228	299,222	286,108

*To refineries in California. †East of California. ‡Estimated with production of by product coke as a basis.

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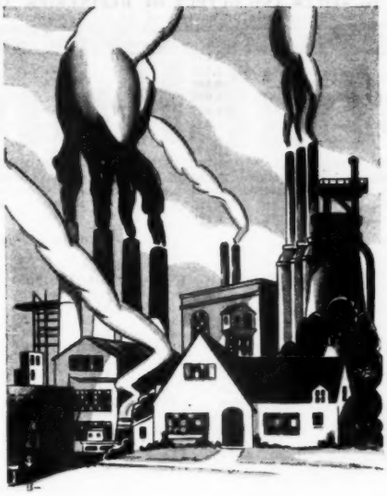

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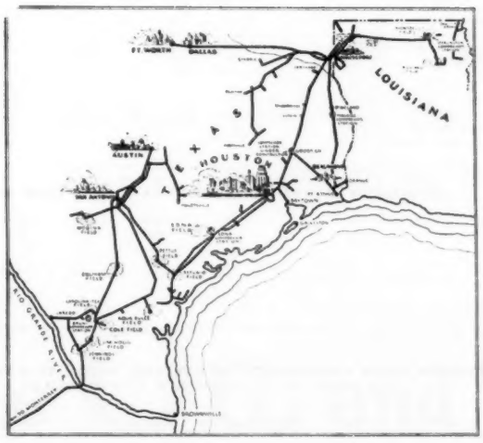

The map at the left briefly outlines the extent of Natural Gas System service—a system that is being constantly expanded to keep a pace ahead of the demands of industries and homes which it serves.

UNITED GAS SYSTEM

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C&B Sealed Level Gauge

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C&B Loading Head

NOTE the set of peep gauges, now an integral part of the well-known C&B Safety Loading Equipment. Their simplicity and non-breakability constitute their own recommendation.

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STEARNS-ROGER MFG. CO., DENVER
MID-CONTINENT AGENCY

Originators of Oil-Froth Absorbers

RUNS TO STILLS AND OUTPUT OF REFINERIES, AUGUST, 1930
(Thousands of barrels of 42 U. S. gallons)

	Crude oil			Unfinished oils rerun	Natural gasoline	Total input
	Domestic	Foreign	Total			
East Coast	10,075	5,220	15,295	719	106	16,111
Appalachian	2,771	....	2,771	217	42	3,030
Indiana, Illinois, Kentucky, etc.	9,136	....	9,136	206	238	9,580
Oklahoma, Kansas, Missouri	8,936	....	8,936	365	451	9,752
Texas	18,623	130	18,753	1,252	1,140	21,145
Louisiana and Arkansas	5,017	284	5,301	446	323	6,070
Rocky Mountain	1,823	....	1,823	409	132	2,364
California	17,274	....	17,274	213	*1,580	19,067
Total United States	73,655	5,634	79,289	3,818	4,012	87,119
Texas Gulf Coast	13,415	130	13,545	1,164	868	15,577
Louisiana Gulf Coast	3,403	284	3,687	53	206	3,946

		Gas oil and fuel oils					
	Gasoline	Kerosene	Gas oil and distillate fuels	Residual fuel oils	Total	Lubricants	Wax (thousands of pounds)
East Coast	5,388	523	1,856	5,246	7,102	904	15,960
Appalachian	1,302	306	205	312	517	431	7,840
Indiana, Illinois, Kentucky, etc.	5,339	369	654	1,106	1,760	347	2,800
Oklahoma, Kansas, Missouri	5,231	614	488	1,670	2,158	251	2,800
Texas	8,963	992	1,547	5,340	6,887	689	2,800
Louisiana and Arkansas	2,360	475	444	1,199	1,643	80	7,280
Rocky Mountain	1,159	64	91	402	493	33	280
California	7,668	632	1,546	7,756	9,302	236	....
Total United States	37,410	3,975	6,831	23,031	29,862	2,971	39,760
Texas Gulf Coast	6,370	789	1,259	3,460	4,719	659	2,800
Louisiana Gulf Coast	1,701	431	245	720	965	61	7,280

		Other finished products				Unfinished products	Shortage
	Coke (tons)	Asphalt (tons)	Road oil	Miscellaneous	Total		
East Coast	12,600	171,300	69	37	106	365	660
Appalachian	2,900	8,400	..	36	36	199	150
Indiana, Illinois, Kentucky, etc.	60,000	46,000	266	347	613	446	127
Oklahoma, Kansas, Missouri	30,400	2,500	164	124	288	558	473
Texas	44,900	19,600	12	9	21	1,882	1,364
Louisiana and Arkansas	10,200	52,500	53	137	190	722	233
Rocky Mountain	11,000	400	89	38	127	355	74
California	100	44,900	163	139	302	152	524
Total United States	172,100	345,600	816	867	1,683	4,679	3,615
Texas Gulf Coast	37,400	19,600	12	1	13	1,673	1,045
Louisiana Gulf Coast	10,000	39,500	..	130	130	273	91

*Includes 97,000 bbls. run through pipe lines.

STOCKS HELD BY REFINING COMPANIES, AUGUST 31, 1930
(Thousands of barrels of 42 U. S. gallons)

			Gas oil and fuel oil		
	Gasoline	Kerosene	Gas oil and distillate fuels	Residual fuel oils	Total
East Coast	6,373	1,838	4,509	5,494	10,003
Appalachian	1,402	283	687	477	1,164
Indiana, Illinois, Kentucky, etc.	6,145	818	1,732	2,467	4,199
Oklahoma, Kansas, Missouri	3,499	643	2,042	3,122	5,164
Texas	6,353	1,300	2,739	7,315	10,054
Louisiana and Arkansas	1,283	934	578	1,366	1,944
Rocky Mountain	2,100	248	143	1,156	1,299
California	14,456	1,966	5,902	(*)	5,902
Total	41,612	8,030	18,332	21,397	39,729
Texas Gulf Coast	4,165	1,165	2,434	4,350	6,784
Louisiana Gulf Coast	957	902	431	776	1,207

		Wax (thousands of pounds)			Coke
	Lubricants	Crude scale	Refined	Total	(tons)
East Coast	3,309	62,412	23,994	86,406	44,800
Appalachian	1,312	24,935	3,671	28,606	6,800
Indiana, Illinois, Kentucky, etc.	934	16,831	2,834	19,665	151,500
Oklahoma, Kansas, Missouri	717	4,350	2,699	7,049	92,300
Texas	2,312	776	10,127	10,903	416,400
Louisiana and Arkansas	160	79,204	2,147	81,351	35,700
Rocky Moutain	170	19,230	1,780	21,010	123,500
California	1,247	....	....	....	123,200
Total	10,161	207,738	47,252	254,990	994,200
Texas Gulf Coast	2,222	761	10,127	10,888	386,600
Louisiana Gulf Coast	154	79,204	2,147	81,351	35,600

		Other finished products			Unfinished oils		
	Asphalt	Road oil	Miscellaneous	Total	Natural gasoline	Other	Total
East Coast	121,300	44	36	80	145	9,379	9,524
Appalachian	5,300	..	80	80	6	1,567	1,573
Indiana, Illinois, Kentucky, etc.	62,500	108	196	304	25	5,352	5,377
Oklahoma, Kansas, Missouri	4,500	40	22	62	12	3,470	3,482
Texas	9,400	8	15	23	97	15,503	15,600
Louisiana and Arkansas	47,500	2	9	11	12	3,662	3,674
Rocky Mountain	4,800	48	24	72	1	1,655	1,656
California	60,500	165	106	271	1,763	†8,287	10,050
Total	315,800	415	488	903	2,061	48,875	50,936
Texas Gulf Coast	9,300	8	6	14	83	13,542	13,625
Louisiana Gulf Coast	40,800	..	8	8	11	2,846	2,857

*Included with heavy crude. †Includes 2,600,000 bbls. tops.

NUMBER OF WELLS COMPLETED IN THE UNITED STATES*

	August, 1930	July, 1930†	August, 1929	Jan.-August, 1930	Jan.-August, 1929
Oil	992	1,051	1,669	8,743	10,111
Gas	295	239	252	1,807	1,770
Dry	682	565	741	4,639	5,180
Total	1,969	1,855	2,662	15,189	17,061

*From The Oil and Gas Journal and California office of American Petroleum Institute. †Revised.

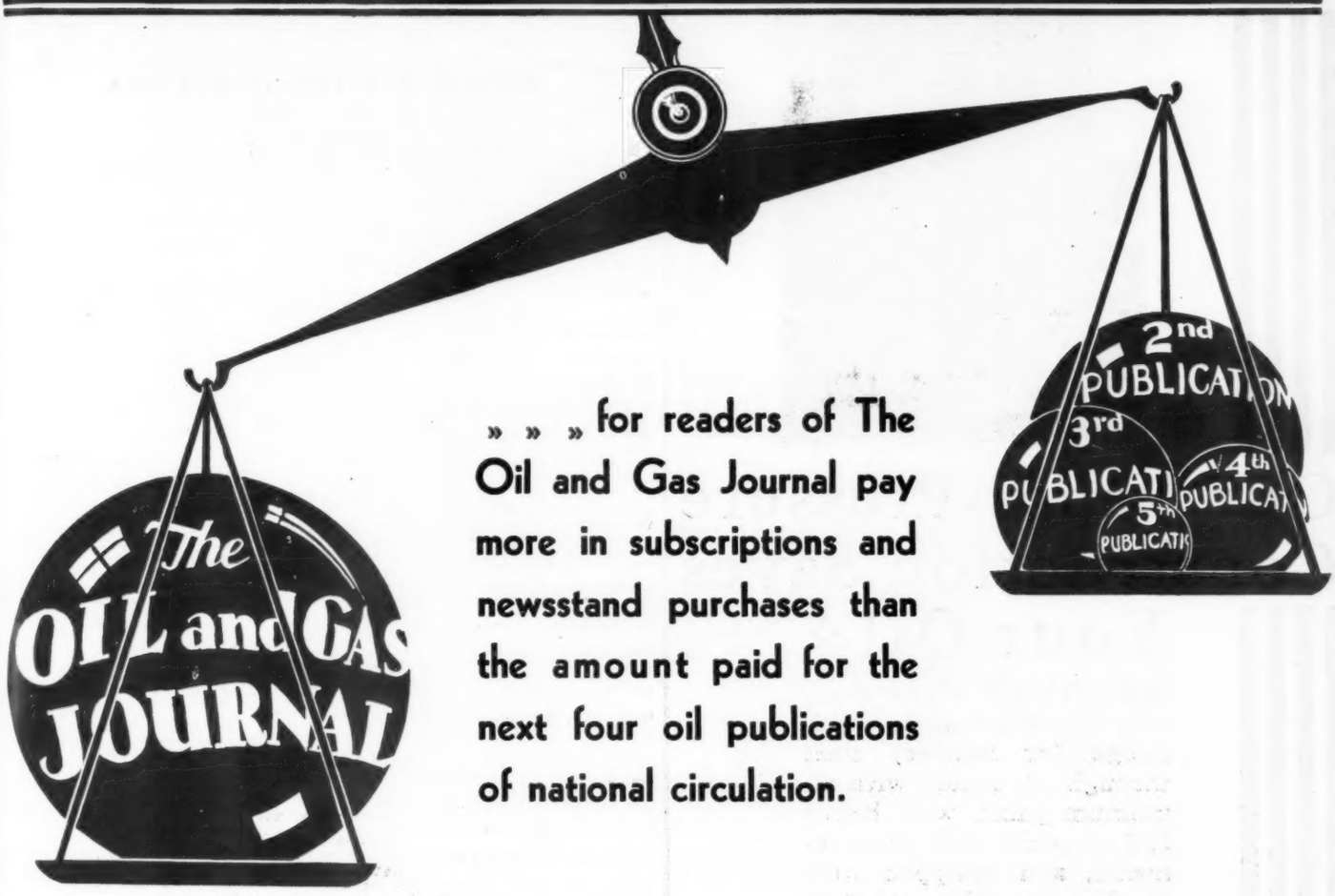
SHIPMENTS FROM CALIFORNIA TO EASTERN PORTS IN UNITED STATES*
(Thousands of barrels of 42 U. S. gallons)

	August, 1930	July, 1930	August, 1929	Jan.-August, 1930	Jan.-August, 1929
Crude oil	....	....	198	....	1,299
Refined products	1,998	2,770	2,642	16,819	17,066
Gasoline	1,834	2,234	2,367	13,880	15,027
Kerosene	....	....	....	186	72
Gas oil	157	524	203	2,402	1,629
Diesel oil	....	....	....	208	98
Fuel oil	2	3	....	25	70
Lubricants	4	8	71	111	150
Asphalt	1	1	2	13	20

*Compiled by E. T. Knudsen of the San Francisco office of the Bureau of Mines.

(Continued on Next Page)

It must have MORE WEIGHT··



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GASOLINE PRODUCTION BY THE VARIOUS METHODS, AUGUST, 1930
(Thousands of barrels of 42 U. S. gallons)

	Straightrun		Cracked		Natural gasoline		Grand total
	Total	%	Total	%	Total	%	
East Coast	2,716	50	2,566	48	106	2	5,388
Appalachian	789	61	471	36	42	3	1,302
Ind., Ill., Ky., etc.	2,468	46	2,633	49	238	5	5,339
Okla., Kans., Mo.	2,879	55	1,901	36	451	9	5,231
Texas	4,045	45	3,778	42	1,140	13	8,963
Louisiana and Arkansas	923	39	1,114	47	323	14	2,360
Rocky Mountain	482	42	545	47	132	11	1,159
California	4,630	60	1,458	19	1,580	21	7,668
Total	18,932	50	14,466	39	4,012	11	37,410
Texas Gulf Coast	2,466	39	3,036	47	868	14	6,370
Louisiana Gulf Coast	674	40	821	48	206	12	1,701

WILDCAT OPERATIONS IN OKLAHOMA

(Continued from Page 42)

COMANCHE COUNTY

Croy & Young's No. 1 Cline, NW NE NE Sec. 8-3-10w .... Rig.
Shasta Oil Co.'s No. 1 Romwalt, SW NW Sec. 11-2-10w .. Shut down 1,709 ft.
G. W. Stogner's No. 1 Doebel, C SW SW Sec. 3-3-9w .... Shut down 1,460 ft.

GARFIELD COUNTY

E. L. Love et al's No. 1 White, SE cor. NW Sec. 9-24-6w ..... Fishing 5,721 ft.

GRADY COUNTY

J. V. Bailey's No. 1 Hubbard, C NE NW Sec. 1-10-6w .... Shut down 100 ft.

GRANT COUNTY

Bu-Vi-Bar and Amerada's No. 1 Hurst, C SW Sec. 25-26-5w ..... Drlg. 5,380 ft.
Cowden et al's No. 2 Vollmer, CEL NE SW Sec. 22-25-4w. Shut down 5,640 ft.

GARVIN COUNTY

McMinn et al's No. 1 Carson, NE NW Sec. 5-3-4w ..... Abandoned 3,026 ft.
Nelson et al's No. 1 Strickland, NE NW Sec. 10-4-3w .... Shut down 2,652 ft.

GREER COUNTY

French's No. 1 Murphy, SW NW SE Sec. 23-7-21w .... Drlg. 350 ft.

HARMON COUNTY

Harmon-Tex Oil Co.'s No. 1 Hoadley, NE cor. Sec. 17-4-24w ..... Drlg. 2,455 ft.
S. M. Stauffer's No. 1 Castleman, SW NE Sec. 8-4-26w.. Shut down 625 ft.

HARPER COUNTY

Empire's No. 1 Bruce, C NE SW Sec. 12-25-20w ..... Drlg. 6,788 ft.
Sinclair Oil & Gas Co.'s No. 1 Howell, C SW SW Sec. 14-26-24w ..... 20,000,000 ft. gas 5,350-5,400 ft.; total depth 5,589 ft.; shut down; sprayed 50 bbls. gasoline.

HASKELL COUNTY

I. T. I. O.'s No. 1 Blake, SW NW Sec. 2-10-21 ..... Drlg. 901 ft.
Mid-Western's No. 1 Poister, C NE SE Sec. 33-10-22 .... Shut down 4,230 ft.
Holden's No. 1 Phillip, SE cor. Sec. 3-9-18e ..... Shut down 1,860 ft.
Marion Oil's No. 1 Sanders, NW NE NW Sec. 10-9-18e .. Shut down 2,387 ft.
Sanboise Gas' No. 1 Unknown, SW NW SE Sec. 32-9-21e.. Shut down 2,100 ft.

HUGHES COUNTY

Wright et al's No. 1 Ott, SE SW Sec. 15-5-11 ..... Shut down 1,645 ft.
Canady et al's No. 1 Kanard, NW SW Sec. 29-9-12 ..... 1,000,000 ft. gas 2,284 ft.; shut down 4,515 ft.
Irwin et al's No. 1 Jones, SE NW Sec. 30-5-10 ..... Shut down 4,270 ft.

KAY COUNTY

Blackwell Oil & Gas Co.'s No. 1 Harshman, Sec. 2-26-1w.. Rig on ground.
Boucher Oil Co.'s No. 1 Jefferson, NE SW Sec. 32-26-1w ..... Drlg. 1,070 ft.
Alco Royalty Co.'s No. 1 Wolf, SE SW SE Sec. 34-26-2w.. 5,000,000 ft. gas 4,390-4,420 ft.; shut down.
Blankinship Petroleum Co.'s No. 1 Hansen, SW NW SW Sec. 17-27-2 ..... Sand 3,590-97 ft.; swabbed 34 bbls. after 40-qt. shot; flowed 34 bbls. and shut down.

KINGFISHER COUNTY

Prairie and Slick's No. 1 Wright, C NW SW Sec. 23-15-5w ..... Drlg. 5,075 ft.
Galt Brown's No. 1 Wolf, NW SE Sec. 6-16-7w ..... Drlg. 6,250 ft.

KIOWA COUNTY

Riley et al's No. 1 Grebb, SW NE Sec. 6-7-16w ..... Drlg. 1,090 ft.

LEFLORE COUNTY

Red Bank Oil Co.'s No. 1 fee, SE SW NW Sec. 23-9-24.. Drlg. 6,290 ft.; top Wilcox 6,128 ft.

LATTIMER COUNTY

Le Flore Oil Co.'s No. 1 McBee, NW cor. Sec. 3-7-21 .... Shut down 3,601 ft.
Mid-Western's No. 1 Morris, C NW SE Sec. 12-6-21 ..... Rig.
Limestone Oil & Gas Co.'s No. 1 Murray, NE cor. Sec. 25-5-18 ..... Drlg. 1,900 ft.

LINCOLN COUNTY

Atlantic Oil Prod. Co.'s No. 1 Parker, SE NW Sec. 5-14-6 ..... Drlg. 4,591 ft.

LOGAN COUNTY

Slick & Ramsey's No. 1 Jones, SE NW Sec. 24-17-2w .... Drlg. 4,952 ft.
Prairie and Slick's No. 1 Morgan, NW NE Sec. 33-16-1w ..... Shut down 5,601 ft.
Eason Oil Co.'s No. 1 Young, C SW NE SW Sec. 34-17-4w. Drlg. 4,942 ft.

McINTOSH COUNTY

Patterson et al's No. 1 Smith, SW cor. NW SE Sec. 32-9-16 ..... Shot 240 qts. 5,446-5,559 ft.; shot went off up hole; fishing.

McCLAIN COUNTY

Prairie's No. 1 Parkinson, SW NW Sec. 22-7-2w ..... Drlg. 1,300 ft.

MUSKOGEE COUNTY

Gillespie's No. 1 Shepard, C SW SW Sec. 35-12-19 ..... Rig.
Dunbar et al's No. 1 West, NE SE NE Sec. 2-11-19 ..... Shut down 735 ft.
I. T. I. O.'s No. 1 Lacey, SE NW Sec. 31-12-19 ..... Comp. 721-45 ft.; 1,500,000 ft. gas.
Sioux Oil Co.'s No. 1 Unknown, NW SE Sec. 21-11-19 ... Shut down 1,011 ft.

NOBLE COUNTY

Barnsdall's No. 1 Miksch, NW SW Sec. 12-21-1 ..... Drlg. 1,825 ft.
Weaver & Craigin's No. 1 Frederick, C SW NE Sec. 4-24-1w ..... Drlg. on iron 2,425 ft.

OKFUSKEE COUNTY

Henry Oil Co.'s No. 1 Harjo, Sec. 36-12-9 ..... Drlg. 4,182 ft.
E. L. Robinson's No. 1 Rice, NW Sec. 2-10-9 ..... Location.
Shepard et al's No. 1 Neveas, SE NW SW Sec. 3-12-10.. Shut down 3,661 ft.

OKLAHOMA COUNTY

L. C. Hivick's No. 1 Sunset Addition, NW SW NW Sec. 17-11-3w ..... Shut down 5,515 ft.
Mid-Kansas Oil & Gas Co.'s No. 1 Messer, SW cor. Sec. 32-14-3w ..... Wilcox 6,697-6,771 ft.; shot with 90 qts. and 140 qts.; flowed 452 bbls.
Prairie and Slick's No. 1 Dill, SE NW Sec. 17-13-3w .... Shut down 6,821 ft.; P. B. to 6,530 ft.; to shoot.
Warr et al's No. 1 Castle, SW NW Sec. 20-11-3w ..... Shut down 6,440 ft.
J. F. Cuniff, trustee's No. 1 Church Land, NE SW SE Sec. 17-12-4w ..... Shut down 6,700 ft.
Magnolia and Ramsey's No. 1 Johnson, C NE SW Sec. 35-13-3w ..... T. D. 7,212 ft.; P. B. to 6,280 ft.; shut down.
Ryan Consolidated's No. 1 Lawton, NE NW Sec. 3-11-2w. Shut down 6,903 ft.; plugged back to 6,319 ft.; shot 40 qts.; no show; shut down.

PAWNEE COUNTY

Morgan & Flynn's No. 1 Freeman, NW cor. Sec. 1-20-5 .. Drlg. 1,870 ft.
Sperry et al's No. 1 Mullrap, SE SW Sec. 2-22-5 ..... Rig.
L. E. Wentz' No. 1 G. Lilly, SE SW NE Sec. 26-22-3 .... Drlg. 2,453 ft.
Flynn & Morgan's No. 1 Jones, SW NE Sec. 22-20-5 .... Drlg. 3,622 ft.
Cochran et al's No. 1 Green, NE cor. SW Sec. 15-23-5 .... Rig.

PITTSBURG COUNTY

Apex et al's No. 1 Walker, NW SE Sec. 18-7-13 ..... Drlg. 430 ft.
C. Cannady's No. 1 Jones, NW cor. Sec. 14-8-14 ..... Rig.

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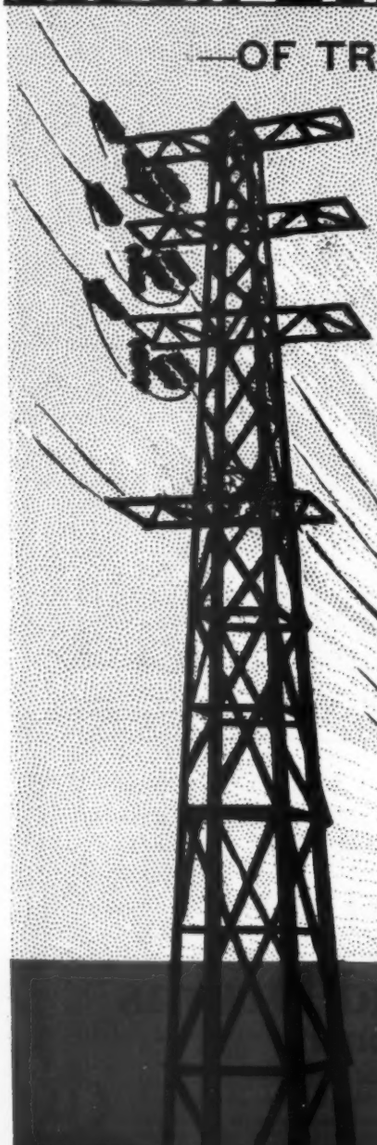

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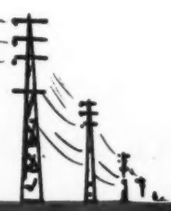

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GENERAL OFFICES—ABILENE, TEXAS

POTTAWATOMIE COUNTY

The Texas Company's No. 1 Knight, SW SE Sec. 3-8-3 ..Shut down 5,115 ft.

ROGER MILLS COUNTY

Bucy & Stone's No. 1 Williams, C SW Sec. 23-12-24w ...Shut down 2,245 ft.
L. C. Hivick's No. 1 Davis, C NW NE Sec. 4-11-26w ....Shut down 2,905 ft.

SEMINOLE COUNTY

Sunray Oil Co.'s No. 1 Sunday, NW SE Sec. 35-5-5 .....Location.

WASHITA COUNTY

Petroleum Holdings, Inc.'s No. 1 Music, NW cor. Sec. 10-9-20w .....Shut down 280 ft.

WOODS COUNTY

Gypsy-Prairie et al's No. 1 Thompson, SE cor. SW Sec. 10-25-15w .....Shut down 6,104 ft.
Sinclair Oil & Gas Co.'s No. 1 Showwalter, C SW SW Sec. 33-27-16w .....T. D. 7,280 ft.; plugged back to 6,730 ft. to test.

WOODWARD COUNTY

Farrond et al's No. 1 Unknown, SE cor. SW SE Sec. 2-22-17w .....Shut down 1,387 ft.
Prairie Oil & Gas Co. et al's No. 1 Wilbur, NE cor. NW Sec. 32-23-17w .....Shut down 7,445 ft.

OKLAHOMA PANHANDLE

CIMARRON COUNTY

Magnolia's No. 1 School Land, C SW NE Sec. 27-5-5 ..Drlg. 4,560 ft.

TEXAS COUNTY

Argus Prod. Co.'s No. 1 Fischer, C NW, Sec. 29-6-14 ....Locations.
Three Way Oil Co.'s No. 1 Crane, SW NW Sec. 11-1-18 .....Shut down 4,425 ft.
Palo Alto Oil Co.'s No. 1 Graves, NE SW SW Sec. 23-2-18e .....Spudded; shut down.

SOUTHERN OKLAHOMA

ATOKA COUNTY

Bryan-Croxton's No. 1 Mason, NW SE NW Sec. 4-1s-14..Abandoned 1,850 ft.
Brookshire's No. 1 Guinn, NW cor. Sec. 18-3s-10 .....Shut down 100 ft.

BRYAN COUNTY

Bryan County Oil's No. 1 Childs, NW SE SW Sec. 7-7-10.Shut down 355 ft.
Bush et al's No. 1 Commerce Trust, NE cor. Sec. 36-6s-9 .....Shut down 525 ft.
Johnson et al's No. 1 Usery, SE SW SE Sec. 14-16s-7e ..Shut down 485 ft.
Marshall's No. 2 fee, C SW NW Sec. 26-5s-7 .....Shut down; 6-in. csg. 265 ft.

CARTER COUNTY

Campen-Lasater Co.'s No. 1 Anderson, NE cor. SE NE SE Sec. 32-4s-2 .....Shut down 2,590 ft.

CHOCTAW COUNTY

Choctaw Petroleum Co.'s No. 1 Wilson, SW cor. SW Sec. 15-6s-19e .....Abandoned 1,345 ft.

COTTON COUNTY

H. J. Dillard's No. 1 McMillan, SE NW Sec. 2-4s-13w ....Shut down 2,705 ft.

LOVE COUNTY

Hobbs et al's No. 1 Roberts, NE cor. SW Sec. 20-6s-3w ..Shut down 3,130 ft.
Gilcrease Oil's No. 1 Burkhart, NE NW Sec. 13-6s-1 ....Rig.

MARSHALL COUNTY

Keiner Oil's No. 1 Barnard, NW NE SW Sec. 28-5S-5....Drlg. 100 ft.
Pace et al's No. 1 Hicks, SW NW Sec. 8-6s-7 .....Drlg. 1,503 ft.
McCrory et al's No. 1 Adams, NE SW SE Sec. 31-7s-6 ..Rig.
Akers et al's No. 1 Spicer, SW SE SE Sec. 33-5s-7e ....Shut down 370 ft.

McCURTAIN COUNTY

Milton et al's No. 1 Vase, SW NW Sec. 26-6s-21 .....Shut down 2,287 ft.

STEPHENS COUNTY

Obermyer et al's No. 1 Skelton, NE SW SW Sec. 32-15-7w .....Drlg. 300 ft.
R. Southard's No. 1 McKinney, NE cor. Sec. 25-1-8n ....Shut down 1,060 ft.

WILDCAT OPERATIONS IN KANSAS

(Continued from Page 44)

ELK COUNTY

Aladdin's No. 1 Donnell, NE SE SW Sec. 26-29-10 .....Drlg. 2,129 ft.
Croft & Frazier's No. 1 Keys, SE NE Sec. 26-31-10 ....Abandoned 1,540-55 ft.; shot 120 qts.; show oil; T. D. 1,989 ft.

ELLSWORTH COUNTY

Milton et al's No. 1 Kester, SE NE Sec. 6-14-9w .....Spudding.
Aladdin and Carter Oil Co.'s No. 1 Barecky, C NW Sec. 3-16-10w .....Drlg. 205 ft.
Slick et al's No. 1 Hecken, NW cor. Sec. 25-17-10w ....8,000,000 ft. gas 2,980-91 ft.; drlg 3,048 ft.

FORD COUNTY

Swain et al's No. 1 Kenthorne, C NW Sec. 21-25-24w ..Drlg. 3,900 ft.

GOVE COUNTY

Johnson and Atlantic's No. 1 Wright, SE NE Sec. 11-12-27w .....Drlg. 1,289 ft.
Valerius & Baucher Oil Co.'s No. 1 Todd, NW cor. Sec. 24-13-27w .....Drlg. 4,410 ft.

GRAHAM COUNTY

Gulf Coast Oil Co.'s No. 1 Johnson, C S half Sec. 27-8-25w.Shut down 4,370 ft.

GRANT COUNTY

McKenna et al's No. 1 Sullivan, NE cor. Sec. 12-29-38w..Shut down 50 ft.

GREENWOOD COUNTY

Staats et al's No. 1 Swan, NE NW Sec. 3-25-12 .....Rig.
Bundy, Smith & O'Neil's No. 1 Ford, NE NW Sec. 28-25-13 .....T. D. 1,575 ft.; water; abandoned.
F. Konkay et al's No. 1 Rock, NW NE NE Sec. 7-27-12..Shut down 1,836 ft.

HARPER COUNTY

Atkinson et al's No. 1 Misak, SE cor. Sec. 25-34-6w ....Drlg. 3,677 ft.
Beeler et al's No. 1 Bear, C NE Sec. 21-31-6w .....Shut down 1,830 ft.

KINGMAN COUNTY

Skelly Oil's No. 1 Miles, NE cor. Sec. 30-27-10w .....Drlg. 1,550 ft.
Slick, Pryor & Lockhart's No. 1 Wetherall, NE SW Sec-36-29-6w .....4,485-4,535 ft.; hole full water; abandoned.

KIOWA COUNTY

Phillips-Prairie's No. 1 Bean, NE SE Sec. 10-30-17w .....Drlg. 4,230 ft.
McKenna et al's No. 1 Ralson, C NE Sec. 14-28-20w ....Rig.

LYONS COUNTY

Griffith et al's No. 1 King, NW cor. Sec. 8-19-10 .....Shut down 910 ft.

MARION COUNTY

Waldwell's No. 1 La Master, NW cor. Sec. 31-22-4 .....Rig on ground.
Magnolia Pet. Co.'s No. 1 Davis, SE NW Sec. 18-21-2 ..Drlg. 3,128 ft.
Dixie and Arkansas Fuel's No. 1 Hacker, NW NE Sec. 6-17-1 .....T. D. 3,505 ft.; water; abandoned.
Marshall et al's No. 1 Higgins, NE cor. Sec. 33-19-5 ....Rig.

MARSHALL COUNTY

Swicker & Sincox's No. 1 Remple, C N half NW Sec. 22-4-9 .....Shut down 1,245 ft.
Brazier et al's No. 1 Runkel, SE NW Sec. 13-2-6 .....Shut down 50 ft.

McPHERSON COUNTY

McPherson Oil Co.'s No. 1 Kuns, SE SW, Sec. 11-20-5w..Drlg. 500 ft.
Slick et al's No. 1 Randell, C SW SW Sec. 35-17-5w.....Rig on ground.
Perry et al's No. 1 Unruh, SE NE SE Sec. 27-20-2w ....Location.
Aladdin Pet. Co.'s No. 1 Larson, C NW Sec. 22-18-4w ..Rig on ground.

MORTON COUNTY

Argus Prod. Co.'s No. 1 Plummers, C NE Sec. 11-29-41w .....Drlg. 1,825 ft.
Hydraulic Oil Co.'s No. 1 State Land, NW SE Sec. 22-34-43w .....Shut down 3,200 ft.

MORRIS COUNTY

Pratt et al's No. 1 Whiting, NW SW SW Sec. 34-16-6 ..Shut down 350 ft.
Henderson et al's No. 1 Selsman, SW SE Sec. 24-16-9 ..Rig.
Urschell et al's No. 1 Scott, NE NW Sec. 6-16-6 .....Shut down 2,420 ft.

OSAGE COUNTY

Riggs & Smith's No. 1 Wood, SE NW Sec. 21-14-15 ....Shut down 410 ft.

PAWNEE COUNTY

Phillips' No. 1 Cuthbertson, NE cor. Sec. 27-20-18w ....Drlg. 1,015 ft.

PRATT COUNTY

Wilcox O. & G. Co.'s No. 1 Bappin, SW NW Sec. 7-26-15w .....Fishing 4,353-95 ft.; water.

RENO COUNTY

Braden et al's No. 1 Thersen, SE NE Sec. 6-22-4w ....Drlg. 2,430 ft.
Alco Royalty's No. 1 Kinney, SE cor. Sec. 16-22-7w .....Shut down 2,980 ft.
Shell Pet. Corp.'s No. 1 Popp, NW cor. Sec. 11-25-5w ....Drlg. 2,970 ft.
E. L. Study and H. L. Turner's No. 1 Haury, NE NW Sec. 1-23-4w .....Comp. 3,313-33 ft.; 22,000,000 cu. ft. gas.
United Pet. Co.'s No. 1 Houston, NW cor. Sec. 4-22-10w..Sand 3,545-47 ft.; water; abandoned.
C. A. Cheney and M. M. Valerius' No. 1 Stevens, C NE SE NE Sec. 6-26-7w .....Simpson 4,196-4,266 ft.; water; shut down.

RICE COUNTY

Jasper & Beachka's No. 1 Cupp, SW NE Sec. 22-18-9w ..Drlg. 2,000 ft.
United Pet. Co.'s No. 1 Willman, NE cor. Sec. 29-21-9w ..Shut down 2,455 ft.
Hershey Golden & Skelly's No. 1 Brandenstein, Sec. 10-19-10w .....Abandoned 3,414 ft.
Tatlock et al's No. 1 Ploog, C SW SE Sec. 33-18-9w ....Silicious lime 3,252-53 ft.; flowing 30 bbls. an hr. when shut in.

ROOKS COUNTY

Streeter-Stearns' No. 1 Conger, SE NW NE Sec. 16-10-16w .....Shut down 2,275 ft.

RUSH COUNTY

Prairie et al's No. 1 Lecker, NW SW SW Sec. 5-16-18w..Drlg. 3,460 ft.
Syndicate Oil Co.'s No. 1 Lannen, C SW Sec. 11-18-16w..Location.
McPherson O. & G. Co.'s No. 1 Brack, C NW Sec. 24-17-16w .....Fishing 3,980 ft.

RUSSELL COUNTY

Empire Oil & Ref. Co.'s No. 1 Sherwood, SE NW NW Sec. 21-14-13w .....Drlg. 340 ft.
Austin Drlg. Co.'s No. 1 Rochfellow, SE cor. Sec. 6-13-12w .....Drlg. 2,710 ft.
Gilbreath et al's No. 1 Bratton, C NE Sec. 33-11-13w ..Shut down 2,155 ft.

SEDGWICK COUNTY

Buck et al's No. 1 McNananan, NE NW NW Sec. 2-29-1..Rig.

SALINE COUNTY

Twin Mounds Oil Co.'s No. 1 Weis, C W half NE NW Sec. 20-13-4w .....Shut down 2,155 ft.

STAFFORD COUNTY

Boucher Oil's No. 1 Groves, NE cor. Sec. 9-22-11w ....Drlg. 3,056 ft.
Midwest's No. 36 Richardson, SE cor. Sec. 36-22-12w ....5,000,000 ft. gas 3,542-45 ft.; 3,000 ft. oil in hole; swabbed 287 bbls. 24 hours; drlg. deeper 3,587 ft.

STEVENS COUNTY

Western Prod. Co.'s No. 4 Fee, C NE Sec. 6-33-36w .....Rig.
Argus Prod. Co.'s No. 1 Olsen, C SE Sec. 1-32-35w .....Rigging up standard tools 2,470 ft.
Argus Prod. Co.'s No. 1 Davis, C SW Sec. 31-32-38w .....Rigging up standard tools 2,365 ft.
Braden et al's No. 1 Thelsen, SE NE Sec. 6-22-4w .....Rig on ground.
Mangle et al's No. 1 Youngren, C SE NW Sec. 24-32-39w .....Shut down 2,523 ft.
McNabb and Mid-Kansas' No. 1 Rhinehart, C NE Sec. 23-32-39w .....Rig.

SEWARD COUNTY

Liberal Gas' No. 1 C N half NE Sec. 4-35-34w .....Rig.

SUMNER COUNTY

Magnolia Pet. Co.'s No. 1 Shriver, NW SW Sec. 9-33-2 ..Drlg. 2,930 ft.
Disney et al's No. 1 Fay, C E half SE Sec. 14-34-1w ....Rig.
Davidson et al's No. 1 Strickland, SW cor. SE Sec. 12-35-1w .....Rig.

WASHINGTON COUNTY

Sincox et al's No. 1 Penwell, NW SE NE Sec. 16-3-3 ....Shut down 510 ft.

NATURAL GAS INDUSTRY IN THE UNITED STATES

(Continued from Page 33)

to cause such a rush of capital to lay lines here and there across the continent?

In order to consider this systematically and for the purposes of this article, I have used only four main divisions of the natural gas fields, namely: The Appalachian fields, including all gas produced east of the Mississippi; the Mid-Continent fields which would embrace all of Missouri, Kansas, Oklahoma, Arkansas, Texas, Louisiana and New Mexico; the Rocky Mountain fields and the Pacific Coast fields.

These divisions do not conform to the true geological provinces. The Appalachian province should contain only the fields found in New York, Pennsylvania, eastern Ohio, West Virginia and eastern Tennessee. They should properly also include the gas fields of South Ontario, which will not be discussed in this article.

Michigan produces from its own geologic formation—the Michigan Basin.

On the Cincinnati arch, there is western Ohio, eastern Indiana, central Kentucky, central Tennessee, northern Alabama and northeastern Mississippi.

Illinois production, along with southwestern Indiana and western Kentucky, is from the Interior Coal Basin.

This technical geological division is rather complicated, so we will stick by our own division.

Appalachian Fields

When we say that the gas in the Eastern fields is gradually diminishing, we must not forget the billions of feet of gas that have been produced from this area. Pennsylvania led in the production of natural gas from 1882 to 1909, when its lead was wrested from it only by another eastern State, West Virginia. And West Virginia held the lead until as recently as 1924, when the State of Oklahoma took the leadership westward. Even yet, in 1929, Ohio leads in the number of domestic consumers with approximately 1,300,000 of the 4,500,000 gas users in the United States.

Very little drilling is being done in New York. In fact, only three wells were completed as gas wells in the first six months of 1930. However, one of these, in Dundee County, was good for 12,000,000 feet. One of the interesting storage fields of this country is the Zoar Field, 30 miles south of Buffalo. With 50 pounds differential over line pressure, 10,000,000 feet can be taken out to meet peak demands.

There always has been, and there always will be, considerable drilling in Pennsylvania. But the average initial open flow of the many completions during the past year has been small.

One of the most prolific gas sands ever found has produced billions of feet of gas in Pennsylvania. This is the famous Speechley sand, discovered in 1885 at a depth of 1,900 feet in a well in Venango County. This well is still producing.

There have been many examples of overdrilling and overproducing both in oil and gas fields but perhaps one of the darkest illustrations is that of the McKeesport Field. Located 15 miles southeast of Pittsburgh, what appeared to be a field of tremendous size was soon dissipated. In two short years, the rock pressure had dropped from 1,400 pounds to almost nothing and the delivery per well had dropped from 31,000,000 feet a day to nothing. However, in that short time the field had produced 22,000,000,000 feet of gas. Scenery Hill, 1927-1928, was another McKeesport on a small scale. Thirty-six wells were drilled, of which 16 were dry holes. One year later, four wells were producing, but 1,500,000,000 feet of gas had been taken from the field.

In Ohio, Indiana and Illinois, there had been considerable drilling activity but very little gas production resulted. Of the three, Ohio offers the best opportunity for the opening of small pools here and there.

Early Ohio Fields

The story of the early gas history of Ohio is interesting enough to relate in

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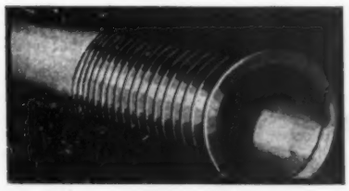

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any article on the industry, so it will be included here.

A well drilled near the village of South Olive, Noble County, in 1814, struck a vein of gas at 30 to 40 feet. This was one of the many wells drilled at the time in the search for salt brine. Many other gas strikes were made soon afterward, but for many years this gas was considered dangerous and the oil which sometimes came with it, as ruinous to the salt brine. As early as 1838, gas was piped in some rude manner into a house at Findlay, Ohio. But it was not until 20 years after Pennsylvania had been active in gas production that Ohio decided to test its rocks. This was in 1884 and it was late in that year that the first deep well was discovered near Findlay. All of the first wells were small, but unlucky number 13 came in at the rate of 12,000,000 feet and with it came the real start of the oil and gas industry in Ohio. The use of gas following the discovery was one of the worst examples of waste, for the town was lighted by huge flares, industries were given free gas and very often wells were ignited just to show off to prospective industrial capital. So, in the winter of 1888, only four years after the discovery well, a shortage of gas existed. However, more gas was discovered in the northern part of the county and Findlay again in 1889 had an ample supply of gas. This is just one of the many examples of the absolute disregard or lack of knowledge of the value of this matchless fuel.

The gas is not all gone in Ohio, though, for one of the outstanding developments in the East in gas in recent years was the Clinton Pool in Summit County, where wells totaling 100,000,000 feet in open flow were drilled.

From statistics prepared by S. S. Wyer, the decline in natural gas available per domestic consumer of Ohio appears to have dropped from 106,000 feet in 1906 to 74,000 feet in 1928. This is gas available from local fields and from West Virginia and does not of course, take into consideration the fact that gas from the Mid-Continent fields may reach into Ohio. At the same time, the number of domestic consumers had increased from 310,000 to 1,200,000.

West Virginia's Fields

In West Virginia, a great many more wells were developed than last year and a greater production maintained, but the average initial volume was off considerably. In the southern part of West Virginia, many drilling opportunities still exist and of course many millions of feet of gas will be produced from the now existing wells. It was in West Virginia that we heard of the "Big Moses" well, one of the great gas wells in history. It was on the farm of Moses Spencer, Indian Creek, Tyler County, and was drilled in 1894 for an open flow of 100,000,000 feet. This well blew open for three or four years before they were able to cap it.

The period following the discovery of this great well and especially around 1900 was one of great activity in West Virginia. Thousands of dry gas wells were drilled and pipe lines started out of the field to Pittsburgh and the other large centers of industry.

Among "firsts" we might here give West Virginia credit for the first gas compressing station which was built by the Hope Natural Gas Co. in 1903 at Hastings. It consisted of two 4,500-horsepower Snow gas engines. In a more jocular vein, I might mention that it seems as though every living gas man helped build or operate this station.

To illustrate the change which has taken place from this time to the present, one of the large companies serves as a good example. With substantially the same market and demand then as now, it had less than 500 wells and one compressing station. Today they have 6,000 wells and 42 compressing stations. In 1917 and 1918, there appeared a shortage of gas from the West Virginia fields for the first time. As to the development of any future deep pools, it looks black, for one producer alone has drilled more than 20 wells over 5,000 feet deep without finding any gas producing sands below the well-known ones.

Kentucky Fields

Kentucky has long been a large producer of natural gas, mostly from the western end and more lately from the eastern fields. At the moment, the eastern Kentucky fields offer more potentialities than any of the other eastern states. The largest gas storage field in the country is located in Central Kentucky in Menifee County. The formation in which the gas has been stored is found at a depth of less than 1,000 feet and covers an area of about 27 square miles, with about 80 wells. About 8,000,000,000 feet have been stored in this field.

At the present time, an 18-inch line is proposed to take gas from the eastern Kentucky fields to Indiana markets.

Very little gas has ever been developed in Tennessee, and, according to geologists, it is not likely that any great amount exists. At the present time though, there is a 16-inch line proposed from the Sunbright fields to Chattanooga, a distance of 100 miles.

Muskegon County in Michigan has proved very disappointing. The gas supply here is practically gone.

Gas has been discovered in several localities in Alabama, although none of the fields has been developed, nor the gas used more than locally. The tests are quite scattered, several wells being drilled near Fayette, a few more near Huntsville and two near Mobile. Geologists doubt if oil or gas will ever be found in paying quantities in the State because in the wells which have been drilled no porous reservoir rock has ever been present.

In Mississippi, two fields exist at the present time, one, an old one at Amory, and another and very recent one at Jackson. The Amory Field in northeastern Mississippi with its two producing wells has served local consumption for some years.

For a good many years, a structure has been shown by geologists to exist at Jackson and they predicted the presence there of oil or gas. But it was not until this year that the first well was drilled. At the present time, September 13, wells have come in with a total production of 400,000,000 feet.

Major lines to and from the Appalachian district have been rumored and at this writing some lines are being laid.

For some months, rumors have been current that the Columbia Gas & Electric system had in mind lines to Washington, Philadelphia and even New York.

The Missouri-Kansas pipe line is being laid from the Hugoton Field of Kansas with Indianapolis as its terminus. A line from the western Kentucky fields will join with it. Progress is also being made on the Chicago line which is being laid from the Panhandle fields of Texas to the midwestern metropolis. These will be dealt with more in detail later.

Mid-Continent Fields

Next, we come to the great gas fields of the Mid-Continent which are at their heyday at present. These fields did not amount to much until after 1900 and it is only in the last five or six years that they have made themselves felt in statistics.

This Mid-Continent area should be divided into several distinct sections for study.

The oldest Kansas and Oklahoma area extends for possibly 400 miles south and west from Kansas City through Tulsa to the southern border of Oklahoma.

It was in 1860 when the first gas wells were discovered in Wyandotte County, Kansas. Gas was discovered at Iola in 1873 and in 1882 at Paola, which town was piped that year. About 1890 gas was discovered near Neodesha. The firm of Guffey & Galey of Pittsburgh became interested and they piped gas into Neodesha in 1894. They sold out to the Forest Oil Co. which finally became the great Prairie Oil & Gas Co. of today. The tremendous amount of gas which was developed attracted many smelters, cement plants and brick plants, many of which exist to this day.

By 1906, enough gas had been discov-

ered to lay lines into the principal Kansas towns in the section and into Kansas City.

It is in this area that we find still producing one of the greatest, if not the greatest, shale gas areas in the world. Thousands of shale gas wells now take the place of the depleted sand wells. Most of the wells are very small in volume, varying from 10,000 to 300,000 feet, but some wells in the Paola-Kansas City area have had volumes as high as 900,000 feet. Very little is known about the rock pressure as it is impossible to shut in the average well without killing it. The depth of these wells is from 300 to 900 feet. Production comes from a black, carbonaceous shale, which usually, but not always, contains salt water.

Hugoton Field

Recently the trend in gas production in Kansas has moved westward to Barber, McPherson and Stevens Counties where large fields have been developed. The field in Barber County, known as the Medicine Lodge Field, is the source of supply for the new Kansas Pipe Line & Gas Co.'s line through central Kansas to Grand Island, Nebr.

The Hugoton Field in Stevens County is looked upon as a second Panhandle field. As yet, it has not been fully developed but it is to be depended upon by several of the largest pipe lines as they pass through Kansas from the Panhandle to Omaha, Des Moines and Chicago. By some, it is predicted that there is a connection with this field through the Panhandle of Oklahoma, where gas has already been developed, with the Texas Panhandle fields.

Missouri came into the list of gas-producing states in 1872 with the drilling of several wells near the old union station in Kansas City. Since then, some 150 wells have been drilled in the vicinity of Kansas City and of these perhaps 100 have been productive on a small scale.

Southern Arkansas has produced billions of feet of gas in the great Smackover and El Dorado Fields, but very little relatively has ever reached the domestic or industrial consumer due to its being dissipated in the production of oil. On the other hand, the fields farther north around Fort Smith have produced gas which has been used for years in the industries and for domestic use at Fort Smith and Van Buren. The Poteau Field across the line in Oklahoma should be included with these long lived fields. Recently a new field has been developed near Clarksville in Johnson County. These wells show an open flow up to 35,000,000 feet with rock pressures of 1,000 pounds.

Louisiana Fields

The Caddo Field produced Louisiana's first gas in 1905 but as there was no market for the gas, it was blown into the air with the hope that oil production would start. Since then, many fields have come and gone. At the present time, there are possibly eight fields of major importance, but only two are outstanding and these will be the only ones discussed. These are, as everyone knows, the Monroe and Richland Parish fields.

Gas was first discovered in the Monroe Field in 1909 but the first commercial well was completed in 1916 while prospecting for oil. No oil was discovered, and it might be added, no oil has ever been discovered, so the well was abandoned. The same year, however, three more wells were drilled and shut in as gas wells. The development continued until at present approximately 700 wells have proven an area of 350 square miles. For a good many years there was no market for the gas other than the many gasoline and carbon black plants which have produced enormous quantities of their respective commodities. The production is from a sand portion of the Annona chalk, found at 2,275 feet, and inasmuch as it does not seem to resemble any formation found elsewhere, it is usually referred to simply as a gas rock. The average well is around 10,000,000 feet while the largest well reported was 50,000,000 feet.

The Richland Parish gas field, although only 10 miles south of the Monroe Field, appears to be producing from a true gas sand. This sand is very fine and is quite loose, accounting for the larger volume wells. Also, due to the cutting action of this fine sand, several blowouts and craters have occurred. A well near the town of Alto which came in for 67,000,000 feet is still blowing open, defying all efforts to subdue it. The proven area of this field is nearly 200 square miles. Due to the richness of the gas in gasoline content, there is a strong prospect for deeper oil.

Southern Gas Lines

The gas from these two fields is now serving many communities never reached by natural gas lines. In the past few years, the Interstate Natural Gas Corp. laid a line to New Orleans, the Memphis Natural Gas Corp. to Memphis, industrials of St. Louis are being served through the lines of the Mississippi River Fuel Corp. and the Southern Natural Gas Corp. reached with natural gas Birmingham and Atlanta. Additional lines are being laid this summer to Mobile, Montgomery, Macon and other cities in Mississippi, Alabama and Georgia. Pensacola, the first Florida city to receive natural gas, will be reached by a line this fall by the same company. Besides these new systems, the Arkansas Natural & United Corp. have augmented their reserves by connections to these fields.

Oklahoma Pools

Oklahoma has not maintained its lead in production figures by any tremendous field such as Monroe or the Panhandle fields but by hundreds of smaller pools scattered all over the State. Several world famous oil fields such as Cushing, Glenn, Tonkawa and Seminole produced billions of feet of gas, but due to the desire for the oil rather than the gas, a great percentage of the gas was wasted.

The Chickasha Field, 50 miles southwest of Oklahoma City, and the Quinton Field, a little farther southeast of Tulsa, are dry gas fields which have produced for years and will continue to produce many more years without any oil being found in their confines. The area around Quinton and to the south of it presents many chances for the development of huge gas fields. In the north central part of the State an undeveloped deep gas territory exists, while many gas fields have been developed to the extreme south. Between these lies at present one of the greatest oil pools of all time, the Oklahoma City Pool. Several dry gas sands were uncovered as the rotary drills progressed to the Wilcox zone, found at an average depth of 6,300 feet. Practically every oil sand showed some gas, but as to recovering any or all of it, there is some doubt. This is due to the tremendous number of rotary holes which have been drilled through these sands, pumping water into them as they passed through. The Nettie Emerson well of the Indian Territory Illuminating Oil Co. with its open flow of 200,000,000 feet is probably the largest gas well ever developed. Very little gas has been taken out of the field by the pipe line companies but tremendous quantities, sometimes estimated at 150,000,000 feet per day, have been used in field operations. Besides this, the usual waste has been occasioned by several wells blowing wild for days at a time.

Gas Fields of Texas

The gas fields of Texas are as numerous as they are in Oklahoma, and, as in this State, scattered to every corner. In fact, the State is so large that its fields are located in eight geological provinces. For our purposes, though, they can be divided into five areas, each of which is distinct.

In the North Central area at Petrolia the first important supply of gas was discovered in 1907. This was piped to Fort Worth in 1909. This field is practically exhausted now as are the Burkburnett, Electra and other oil fields in this area, which once produced gas in large quantities.

The South Texas fields include the Refugio, Cole-Bruni, Jim Hogg, Jennings, White-Point, Edna, Rycade and many others. It is from some of these fields that the United Gas Corp. has its lines to Houston and San Antonio. The

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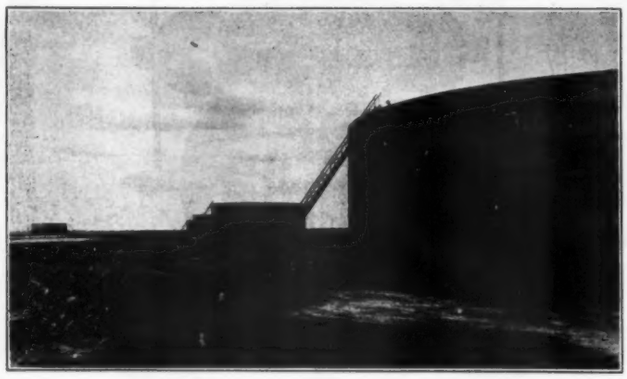

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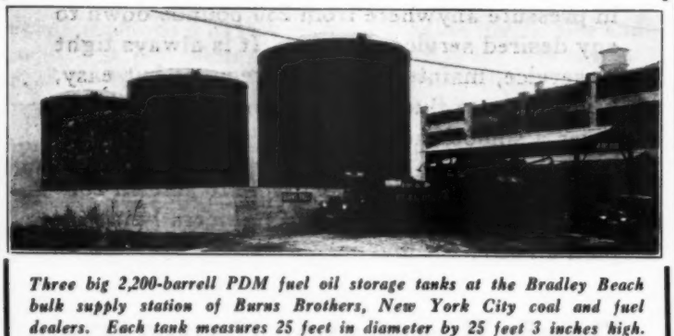

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Houston Pipe Line Co., also serving Houston as well as Galveston, receives its gas from many of these fields.

The first long-distance line to cross the Mexican border was a 12-inch 143 miles long laid by the United Gas Corp. from the Jennings Field to Monterrey, Mexico.

Brownsville, in the point of Texas, is served from the Jim Hogg Field through the Rio Grande Valley Gas Co.

A second Mexican town to receive South Texas gas will be Piedras Negras, across the line from Eagle Pass, Tex., through the line of the Appalachian Gas Corp. Gas for this line is from the Rycade Field.

It is interesting to consider that from these fields it is nearly 600 miles straight across the State to the Panhandle fields.

The Balcones area takes in the Mexia, Powell and Wortham Fields, which, though they were essentially oil fields, produced large quantities of gas. These fields are practically exhausted both as to oil and gas at present.

The West Texas area is an unknown quantity and probably will be for many years, although several large fields have been opened up. One of these, the Big Lake area, is particularly interesting because of the depth of some of the wells. A good many wells had been drilled to the three upper sands which are at 2,450, 3,000 and 6,300 feet. One well, the Texon Oil & Land Co.'s No. 1-B University, was drilled to a depth of 8,525 feet in 1928 when it started flowing. From that day, the deliveries of oil and gas kept up a steady increase until a maximum of 28,000,000 feet of gas and about 3,000 bbls. of oil were produced daily. At this time, six wells are producing from this great depth.

Panhandle Field

The great Amarillo or Panhandle Field of Texas lies in what is termed as the Panhandle of Texas.

The geological structure is part of the Ouachita-Amarillo Mountain Province, which extends from Arkansas, through southern Oklahoma, and into Texas. The anticlinal structure of the Panhandle Field is known to carry gas along its crest for over 100 miles. The gas occurs at depths of from 1,600 to 2,400 feet along the top of the structure and down to 2,900 feet on the flanks.

The first gas discovered in the Panhandle was in December, 1918, in Potter County. At the present time there are nearly 500 gas wells.

The proven gas area of wells over 10,000,000 feet in size is about 1,500 square miles. Roughly, this area is divided among the counties as follows: Hartley, 25; Moore, 447; Potter, 183; Hutchinson, 198; Carson, 296; Gray, 193; Wheeler, 139, and Collingsworth, 3 square miles. The Sayre Field in Beckham County, Oklahoma, may be an extension to this great field.

There are several peculiarities about the field which have proven interesting problems to the geologists. For one thing, the original rock pressure of 430 pounds is only about one-half of what it should be due to the weight of the water column at the depth of the sand. Another is that this pressure is the same regardless of the source of the gas, whether in the granite wash or the dolomite. Another interesting feature is the location of the oil fields all on the north and east of the structure. And the only sulphur gas in the field comes from and in the vicinity of the oil-producing areas.

The total open flow available from the existing wells is between 10,000,000,000 and 12,000,000,000 feet per day. In addition to this, 1,000,000,000 feet is being produced with the oil. Approximately 55 gasoline plants are operating with a daily production of 850,000 gallons a day. In the neighborhood of 23 carbon black plants are burning gas from the field, making 300 tons per day.

Long-Distance Lines

Many major natural gas projects have had their being because of the known enormous reserves in this field. Chief among these have been the Colorado Interstate Gas Co.'s 22-inch line to Pueblo and Denver, the Consolidated Gas Utilities' 14-inch line to Wichita and Hutchinson, Kans., the Cities Service Gas Co.'s 20-inch line to Wichita and Ottawa, Kans., the Lone Star Gas Co.'s 18-inch line to Fort Worth and Dallas, Tex., the Upham 16-inch line to Wichita Falls, Tex., and the West Texas Gas Co.'s 16-inch line to Lubbock and Midland, Tex.

Besides these lines, which have been in operation some time, there are several lines either being built at this time or are proposed. One of these, the Missouri Valley Gas Co. is now working on its 24-inch line to Lincoln, Nebr., Des Moines, Iowa, and to Illinois points. Construction is also progressing on the 22-inch and 24-inch line of the Missouri-Kansas Pipe Line Co. which originates in the Panhandle fields and passes close to the Hugoton Field on its way to Terre Haute and Indianapolis.

Still another line now in the process of construction is the 24-inch line of the Central States Natural Gas Co., starting from the same source of supply and delivering gas to the Insull interests at Chicago.

Besides these lines actually under construction, another one, a 20-inch line to Omaha, has been proposed by the Western Natural Gas Corp.

The capacities of these lines are well over the 500,000,000 mark, but it will probably be some time before the withdrawals from the field through these lines will approach this figure.

New Mexico Fields

New Mexico produces gas from three major fields, one, the Ute Dome Field in the extreme northwestern corner of the State, and from the Maljamar and Jal Fields in the extreme southeastern corner. The Southern Union Gas Co. has recently completed 138 miles of 12-inch from the Ute Dome to Albuquerque. Carlsbad, Artesia and Roswell are served by the Pecos Valley Gas Co. from the Maljamar Field. When gas was delivered from the Jal Field in New Mexico to El Paso, Tex., through the El Paso Gas Co.'s line, it was the the signal for the passing of the last manufactured gas plant in many cities of the State.

The extent of the Lea County or Jal Field is not known but by many it is predicted that it will rival the Panhandle Field.

A projected line by the Western Gas Co. from this area parallels the El Paso Gas Co.'s line to El Paso and thence continues into Arizona to Phoenix and Tucson.

Rocky Mountain States

Of the states in the Rocky Mountain area, Wyoming is the most important as a gas producer. Gas was discovered in the Brenning Basin near Douglas in 1903 but it was 1909 before gas was introduced into any towns. In 1920 enough gas was developed to pipe Casper.

In the past year the Western Public Service Co. laid 475 miles of main line from the Baxter Basin and Clay Basin Fields in Wyoming and from the Hiawatha Dome, partly in Wyoming and partly in Colorado. This line serves Ogden and Salt Lake City, Utah; Preston, Idaho, and Green River, Wyo.

Another major pipe line recently proposed is a 300-mile 24-inch line from the Oregon Basin Field in northwestern Wyoming to Anaconda and Butte, Mont.

Natural gas fields have been developed in many localities in Montana but principally along the northern and eastern limits of the State. The Kevin-Sunburst, Pondera, Bowes and Bowdoin Fields in the north are offset by several fields in Alberta. The towns of Shelby and Great Falls are served from the two former. While the Bowes Field is used only locally, a line has been proposed to Moosejaw and Regina in Saskatchewan. Along the eastern edge of the State, the three major fields, Baker-Glendive, Cabin Creek and Lake Basin, form the reserve for the Minnesota Northern's lines to Williston and other towns of North Dakota, and Rapid City among others in South Dakota.

It might be inserted here that gas in small quantities has been found in artesian wells in both North and South Dakota, but no commercial fields have ever been developed.

Colorado, Utah and Idaho must be in-

cluded in the list of states which have produced gas from time to time but only the first mentioned has ever had anything approaching a commercial field. Along the boundary line between Colorado and Utah, several gas areas are known to exist with wells producing as much as 50,000 feet and with better than 800 pounds rock pressure. These fields have never been developed but it is felt that a drilling campaign is in the offing which will uncover some huge deposits of natural gas. So far as is known, the Wellington Dome in north central Colorado, which supplies Fort Collins and Cheyenne, Wyo., is the only field in these states which is being used. Of course, a small part of the Hiawatha Dome extends over into Colorado from Wyoming and this is being drawn upon as mentioned above.

Pacific Coast

The natural gas industry in California dates back nearly to the forty-niners, for it was in 1854 that the first gas producing well was drilled at Stockton.

Little was heard of the oil or gas industry from that time until 1902 when the first well was drilled in the Ventura Avenue Field. Although some gas was encountered, the well was abandoned. The following year nine wells were drilled to gas sands ranging in depth from 400 to 800 feet. This gas was used in Ventura for some time but the wells were all later abandoned. It was not until 1914 or later that the real potentialities of the field were discovered.

In the meantime, in 1909-1910, large wells were drilled in the Buena Vista Hills. The gas from this field was piped some 40 miles to Bakersfield. In 1912, enough gas was developed to bring into being the Midway Gas Co., which laid 120 miles of 12-inch line over the mountains to Los Angeles. In April, 1913, the first natural gas was delivered to the metropolitan area of Los Angeles. There was not a sufficient supply available at this time, however, to serve only natural gas to the city, so it was mixed with manufactured gas. Up until January, 1927, the ups and downs of the gas production did not justify a separation from the manufactured plant, but at this time the metropolitan area was converted to straight natural gas.

In the past few years the production and waste of natural gas have been tremendous. In town lot drilling areas, such as Santa Fe Springs and Huntington Beach, as much as 75 per cent of the production has been wasted. In the former field, the daily gas production declined from 510,000,000 feet to 50,000,000 feet in 11 months.

The development of the tremendous Kettleman Hills oil and gas field and the Buttonwillow dry gas field (which is the only one in the State) has given California a gas reserve which should last, under proper and conservative producing, for many years. It is estimated that at a daily withdrawal of 4,000,000 feet from the Kettleman Hills Field, the gas should last for 75 years. The wells in this field are of enormous proportions such as being close to 7,000 feet deep, with rock pressures in excess of 3,000 pounds. Continental Oil Co.'s Elliott well produced 6,700 bbls. of 60 gravity oil and 175,000,000 feet of gas against a back pressure of 1,240 pounds.

The Southern California Gas Co., which dominates the Los Angeles area, taps every field in the Los Angeles Basin and now has lines into the Buttonwillow and Kettleman Hills area.

San Francisco Line

After many years of natural gas service in Los Angeles, San Francisco and Oakland have become listed among the natural gas users. Early in 1929 the Pacific Gas & Electric Co. began construction of a 22-inch line from the Buttonwillow and Kettleman Hills Field to San Francisco and Oakland, besides other cities. This line becomes a branch line or "Y" at Milpitas, one branch going to San Francisco and the other on the other side of the bay to Oakland. In the late fall the line was completed and the change-over to natural gas was perfected.

This year, the Standard Oil Co., which owns the controlling interest in the Kettleman Hills Field, formed a new company with the Pacific Gas & Electric Co., called the Standard-Pacific Gas Line, Inc., to build a new line to Richmond. This line, which is partly of 28-inch electric welded construction, parallels for some distance the former line and is tied across to it in four places. From the new line, Stockton, Sacramento and many other inland towns will be served. It has been rumored that next year will see an extension of this line to Oregon and Washington markets.

There are gas indications in Oregon for it has been found in several artesian wells and has been used from them for some time. At a depth of 2,260 feet near Ontario, Ore., considerable gas was encountered.

Farther north in Washington a gas field has actually been discovered and made use of. The Rattlesnake Field, in Benton County, is producing gas from a formation at 700-800 feet. Although the pressure is low, the reserve is estimated to be very large. From the field a line has been laid to several surrounding towns and even as far as Walla Walla, Washington.

Before closing, I wish to thank the many who so kindly assisted me in obtaining the information for this paper. Every person to whom I wrote was very prompt and courteous in answering my many questions. I wish to especially thank E. L. Rawlins of the Bureau of Mines who very kindly turned over his complete file on natural gas fields and H. C. Fowler, acting chief engineer of the petroleum and natural gas division of the bureau, who also sent me material from his personal file. It would make quite an imposing list were I to enumerate the geologies, magazines and bulletins which were consulted. Suffice it to say that I used every one on the subject which was available.

PROPERTIES AND TREATMENT OF MUD

(Continued from Page 92)

and the maximum side of colloidal particles is about 0.0001 mm., or 0.000004 inch. Fineness must be further judged by precipitation tests, to determine the amount that the mud will subside or the amount of free water that will come to the top of the mud after a standard length of time (24 hours is recommended as giving satisfactory indications, and dilution is not desirable). Note that settling tests may be used for two purposes; to determine percentage of "sand" or other coarse constituents, and to determine to what extent the remaining solids are of colloidal nature.

Consistency

Consistency is another important property of mud. This term will be used to include viscosity of fluid mud and plasticity and yield value of plastic muds. A mud that is too thin may wash the walls of the hole and cause caving; it may be lost to the formation in unlimited quantity; it may fail to carry cuttings out of the hole; and when circulation ceases it is apt to drop its load of cuttings and "freeze" the drill pipe. On the other hand, a mud that is too thick is hard to pump; it unloads its cuttings in the ditch imperfectly, if at all; it may build up the wall of the hole to such an extent as to make pulling and running of drill pipe difficult, and it results in slow drilling progress.

The distinction between a fluid and a plastic is important. Some muds are fluid and others are plastic. A fluid is commonly defined as a substance that will yield continuously to any force, no matter how small, if given sufficient time. A plastic will yield only a limited amount until the applied force exceeds some critical value. As applied to mud this means that if the mud is fluid, cuttings will settle out if given sufficient time, but if the mud is plastic, cuttings of less than a certain critical size (which may be very large) will never settle out. While the mud is in the hole it should be in a plastic condition, so that whenever circulation ceases the cuttings (except perhaps the

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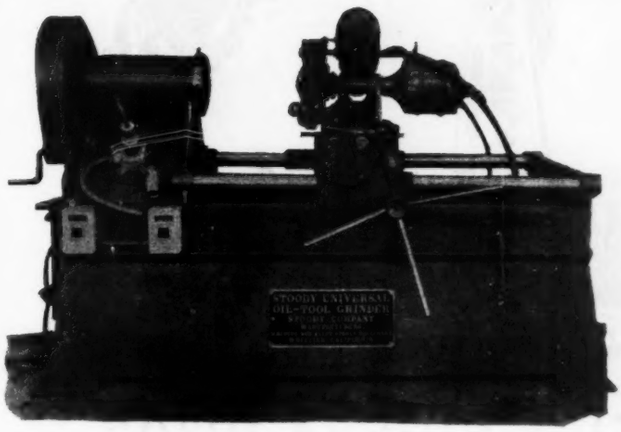

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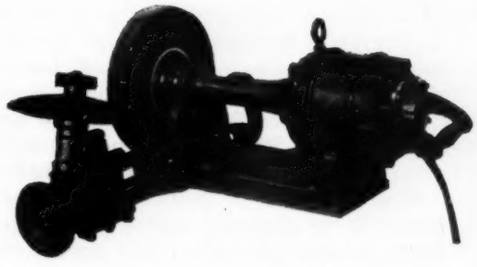

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very coarse ones) will not settle out and stick the bit. On the contrary, when the mud is out of the hole it should behave as a fluid, so that it could be thoroughly freed of cuttings by merely being allowed to settle. The fundamental characteristics of fluids and plastics are illustrated best by Figure 1, adapted from Bingham.

Mud may change from a fluid to a plastic by geling. Many muds, especially those made from bentonite, if sufficiently concentrated, have the interesting and important property of being fluid while in motion but of setting into a fairly rigid gel upon standing. As Bingham puts it, "The structure requires time to form and the fluidity at a given moment depends upon the recent history of the solution." This property is of considerable importance. Such a mud may be thin enough to be pumped easily and yet become plastic and prevent sticking of drill pipe by settling of cuttings when circulation is stopped. It also tends to set as it enters the pores of the formation, and thus combats loss of fluid. Unfortunately, it exhibits the same tendency to gel while in the settling ditch and pit, and thus retains the cuttings tenaciously at the time when they should be unloaded. Special methods, mentioned later, perhaps may overcome this drawback.

For research purposes, viscosity and plasticity should be measured by some standard form of viscosimeter that gives accurate readings in absolute units. Such

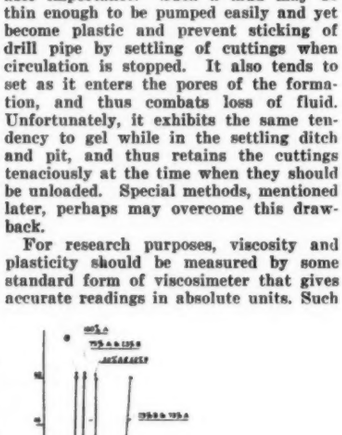

Figure 3—Showing how muds having any reasonable combination of weight and viscosity can be made from mixtures of two materials.

an instrument is described and illustrated by Bingham. For rough measurements in the field, the funnel viscosimeter shown in Figure 2 has been found very satisfactory. Its readings, however, are only comparative, and are a measure of kinematic viscosities which must be divided by specific gravity to make them comparable with absolute viscosities. Over a moderate range of specific gravity, the distinction is not very important, but heavily weighted muds have kinematic viscosities that are misleadingly low. In the following paragraphs, unless otherwise stated, the term viscosity will be used to mean apparent viscosity as measured with the funnel viscosimeter. In the case of plastics, this is really a combination measure of yield value and plasticity that gives only a practical indication of the fluidity.

Characteristics Desired

There is considerable difference of opinion as to the character of mud desired for various drilling conditions, chiefly concerning consistency. It is generally agreed that a mud should be heavy enough to withstand any gas pressure that is likely to be encountered, but increasing weight by ordinary means increases viscosity, which may be objectionable, and often necessitates a cash outlay for material. The practical compromise is hard to establish. It is believed that in many cases, heavier muds are used than are needed, and that most blowouts are caused either by loss of circulation (or otherwise lowered fluid level) or by gas-cut mud. Both of these conditions may be caused or at least made worse by using too heavy a mud; loss of circulation is the result of excess pressure in the hole and can sometimes be stopped by lightening the mud (preferably not thinning it), and gas cutting is caused by the mud being so viscous or plastic (which ordinarily accompanies high weight) that bubbles of gas from the formation cannot escape. There are times, however, when the heaviest mud that can be secured is none too heavy.

Proper consistency is much more a matter of opinion than is weight. This is partly due to failure to distinguish between consistency and weight. An apparent viscosity of 22½ to 25 sec. by the funnel viscosimeter (Figure 2) has been found great enough for ordinary purposes, and at the same time low enough to permit cuttings to settle out satisfactorily in the ditch. Where a hole tends to cave or circulation to be lost, thicker mud may be necessary.

It is, of course, desirable to keep the percentage of coarse constituents as low as possible, as such material causes rapid wear of pumps, probably is useless for plastering the walls of the hole and is a potential cause of stuck drill pipe. Just how coarse a material can be tolerated is questionable. Some people contend that any particle too large to be in the colloidal state is at least "inert" and useless, if not positively objectionable. This would condemn all particles larger than 0.000004 inch diameter (approximately 125,000 mesh). At the other extreme, use of a vibrating screen (discussed later) with 30-mesh screen is maintaining mud in an apparently satisfactory condition.

Treatment of Mud

Treatment of mud at the well to secure and maintain the properties considered desirable is generally very simple. It consists of adding water to reduce weight or viscosity, or adding dry or thick wet mud material to increase weight and viscosity (no separate control of these properties), and circulating the mud through a ditch or pit, or both, with the hope that the cuttings will settle out. If the material used is good and is suited to the drilling conditions, and is properly diluted, the weight and viscosity will be right, and if dilution or thickening is correct, the values of these properties will be satisfactory. Under favorable conditions the ditch may be fairly effective in removing the cuttings. More often, however, cuttings accumulate and the mud becomes progressively worse until it has to be dumped and replaced with new mud (at considerable expense) or until failure to do so causes a bad fishing job.

Admixtures

Better methods for treating mud and controlling its properties are coming into use. One of the best known is the use of special materials that give special properties. With such special materials, muds having practically any combination of qualities can be made. For example, Figure 3 presents curves showing that mud having any reasonable combination of viscosity and weight can be made from the proper mixture of two well-known prepared materials. Similar results, covering a narrower range, can be secured from combinations of various native muds.

Chemical Reagents

The consistency of a mud can be greatly altered without materially changing the weight or concentration by the use of various chemical reagents. Such treatments, however, should be tried out on a sample of the mud on which it is proposed to use them, as some treatments that work well on one mud may have an opposite or other undesirable effect on another mud. For example, addition of a small amount of sodium silicate to an inert mud will decrease its viscosity greatly, probably acting as an emulsifying agent, while a mud fluid having an acid reaction will be thickened by the same treatment, probably through the formation of silica gel. Similarly, a stiff mass of clay will be made fluid by the addition of a little sodium hydroxide or carbonate, and incidentally can be resolidified by the addition of a little acid. According to Fisher, a mixture of sodium aluminate and sodium hydroxide will

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enormously increase the mud viscosity of a swelling clay such as bentonite but will have practically no effect on a nonswelling clay. The apparent conflict probably is due to different kinds of mud, one being a positive and the other a negative colloid. The use of hydraulic lime coagulates a mud, the colloidal particles combining into larger particles, which may cause them to clog crevices and thus restore lost circulation. Mud so treated is not suited for further use. Most clays are flocculated by acids and by acid or neutral salts. Small amounts of alkalies and of alkaline salts deflocculate them, but larger amounts cause flocculation.

Colloids may be classified as suspension colloids and emulsoid colloids. The former have a relatively low viscosity, or for a given viscosity they have a relatively high specific gravity. They are precipitated readily by an electroylte—acid, alkali, or salt. The suspensoid colloids, of which bentonite is an example, are not so easily precipitated by electrolytes, and have high viscosity or low weight for a given viscosity.

Water for Mud Fluid

The nature of the water used in mixing and thinning has a remarkable bearing on the properties of mud. Waters good enough for domestic use may contain enough dissolved impurities to produce surprising effects. This is illustrated by Figure 4, which shows graphically the results of precipitation tests of four different mud materials with water from 10 sources. Two of the materials (B and C) precipitated badly in all waters, while material A settled badly in water No. 7

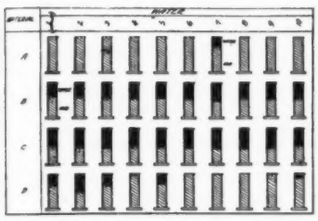


Figure 4—Precipitation tests of rotary muds.

22.5 second mud cut back with equal volume water. 48 hr. settling.

but not at all in others. Material D, which is much like A in many other respects, precipitated badly in several waters that did not precipitate A, and stayed up perfectly in the water that did precipitate A. Therefore waters cannot be classified as good or bad except with respect to certain materials.

"The precipitation of fine particles by electroyltes is well illustrated on a large scale in nature, the finely divided clay carried by many rivers being caused to deposit when the river water mingles with the sea. In this way the silting up of river mouths and the formation of deltas, as in the case of the Nile and of the Mississippi, are brought about."

Various writers point out the significance of the "pH value" of a water or mud as an indication of the behavior to be expected and the proper treatment. This is merely a measure of acidity. Dice suggests that since any electrolyte tends to precipitate a colloid, a measure of the electrical conductivity of a mud should be significant. This would probably be most applicable in the case of suspensoids.

Aside from the more obvious objections to a mud that settles, flocculation (a common form of settling or precipitation) apparently is objectionable because it hinders separation of cuttings. Flocculent mud apparently has sufficient structure to retain cuttings that would settle out if the mud were of the same weight but dispersed. This is evidenced by Table 1, a data sheet showing conditions of mud at an actual well before and after using a water treatment that reduced flocculation. Note that the average "sand" content, while still objectionably high after the treatment (due to other unfavorable conditions), was less than half of what it had been before.

The viscosity of a mud is said to be largely dependent upon the number of colloidal particles per unit volume and almost independent of the size of the particles (so long as they are colloidal). For two muds made to the same viscosity, the one having the larger particles should therefore have the higher specific gravity. Table 2, giving the percentage of solids and specific gravities of muds all made to the same viscosity from four materials, in 10 different waters, shows that for the same viscosity different amounts of material are needed in different waters and different gravities result.

Ditches and Pits

Design of ditches and pits will bear a great deal of study. If the mud is a true fluid, the problem is relatively simple. From the literature on ore dressing, the settling rates of particles of various sizes and gravities can be learned, and having decided the maximum size of particle that can be tolerated, the necessary size of ditch can be calculated. Taggart and Richards both give the necessary data and equations. Taggart points out that the effectiveness of a settling ditch is independent of its depth and also of its ratio of length to breadth. Its horizontal area or product of length by breadth determines its effectiveness.

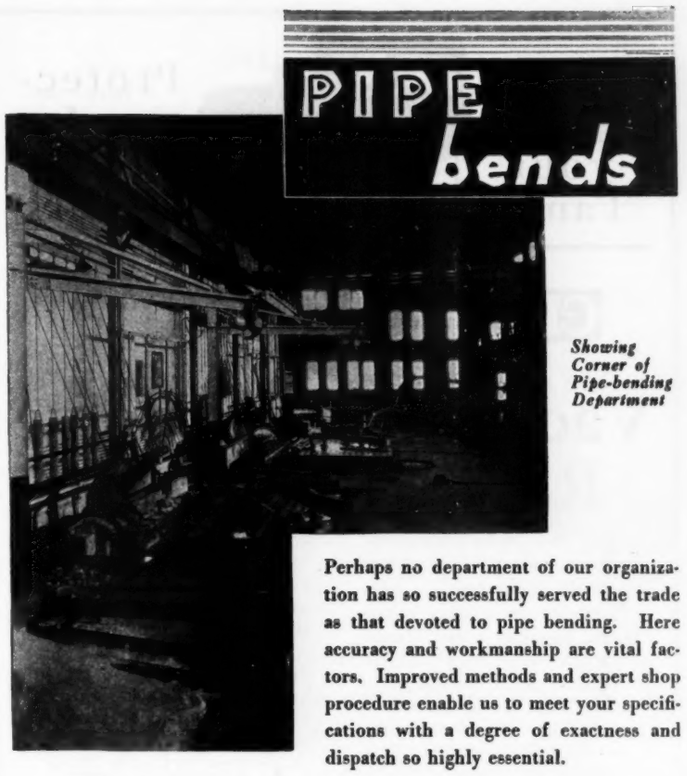
Finkey advocates the rising current classifier as opposed to the horizontal current classifier. For liquid muds the suction pit or an auxiliary might be made an effective rising current classifier by adding a conductor pipe to take the flow from the ditch nearly to the bottom of the pit, and taking suction from a substantially higher level. Of course, provision must be made and used for removing settlings from the pit if it is to be effective. Suction pipes are now sometimes arranged so that they can be raised or lowered, but all too often they are let down nearly to the bottom of the pit and left there. As a result no rising current classification is possible, and what sand is separated by horizontal flow is picked up eventually by the suction.

Unfortunately for the success of ditch and pit classification, many muds (probably the best muds) gel or otherwise become plastic when velocity of flow becomes small. Thus reduction of velocity, which otherwise would permit settling, prevents it. With such materials it is found that there is a certain intermediate velocity of flow at which settling is most nearly satisfactory. This has been noted by Benjamin in other industries. With some muds this is evidenced in connection with rotary drilling by the sand settiing in the high-speed conveyor ditch instead of in the deep "settling" ditch.

Fortunately the change from liquid to plastic state requires an appreciable length of time. This suggests that numerous quick changes from turbulent flow to very slow flow will produce satisfactory classification even of geling muds. It has been observed that with plastic muds most of the cuttings that settle do so in the first few feet of the big ditch, or immediately after turning a corner. It appears useless to have ditches of any considerable length without riffles, changes of direction or other means of temporarily creating turbulence to break down the structure of the plastic. Ditches of considerable width but slight depth, equipped with frequent dams, baffles or riffles are tentatively recommended. Table 3 shows analyses of mud samples taken from the head and foot of an ordinary ditch while drilling. Note that all constituents down to 200 mesh are reduced.

Dilution, Classifying and Rethickening

Probably any mud can be freed of its coarser constituents by well-known means of classification if it is diluted sufficiently. Dilution, however, necessitates thickening of the mud before it is again suitable for use. Thickening is generally accomplished by flocculation, which will take place only if the mud is naturally noncolloidal or is flocculated by chemical treatment. As colloidal mud is generally considered desirable, this is an objection to the process. The flocculated mud generally may be deflocculated (returned to its colloidal state) by further chemical treatment, but this may not always be practical. Such systems appear most ap-



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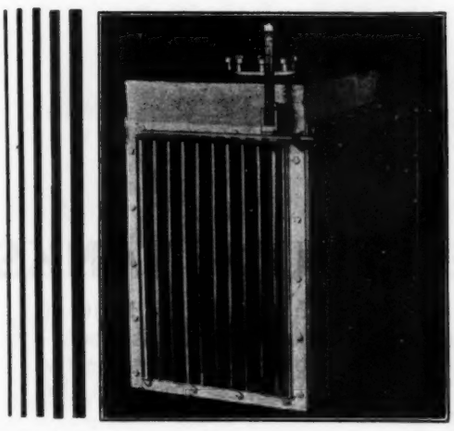

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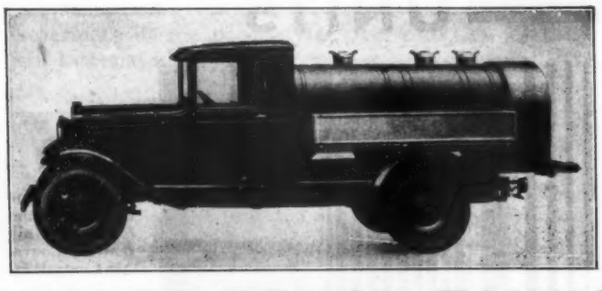

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TABLE 3—EFFECTIVENESS OF ORDINARY DITCH

	Sample—From flow line	Sample—From foot of ditch
Total solids, by weight, pct.	22.6	22.5
Screen analysis of solids, pct.		
On 70 mesh	0.40	0.18
On 100 mesh	0.31	0.13
On 200 mesh	2.74	2.44
On 325 mesh	1.46	1.51
Through 325 mesh	95.09	95.74

Centrifuging

Centrifugal removal of coarse constituents is being tried but data as to results are not yet available. The centrifuge being used is said to be large enough to handle the circulation from several wells and to take out coarse particles down to any desired size.

Doerner points out that there is no fundamental difference between gravity concentration and centrifugal concentration, except that in the latter the acting force is many times greater and the process therefore many times faster. This is probably true in slimes dealt with in the mining industry, which are fluids, but in the case of geling muds such as are sometimes used for drilling there may be important differences. It appears that in a centrifuge there may be enough force to separate even very fine particles from a plastic mud. It may also be that sufficient turbulence exists in a centrifuge to prevent geling while at the same time sufficient force is exerted on the particles to cause their separation in spite of the turbulence.

Screening

Vibrating screens are being tried by several companies, and seem to have considerable merit. In some cases it is planned to have the screen in operation whenever the mud is being circulated, and in others the intention is to use it only occasionally to clean the mud, by-passing it the rest of the time for the sake of economy.

Screens remove practically all particles of diameter greater than the width of the openings through them. Screens finer than 60 mesh have rarely if ever been used. Screens of 30 or 40 mesh appear much more practical, and it would seem that material much finer than any of these meshes would be objectionable. As noted previously, material coarser than 125,000 mesh is not colloidal. Experience, however, indicates that at least under some conditions continuous use of a 30-mesh vibrating screen will keep mud in good condition for an unlimited length of time.

Table 4 gives analyses of mud samples from a well where a 30-mesh vibrating screen was in use. Comparing analyses of mud before and after passing through the screen, it appears that the screen eliminated practically all of the +30-mesh material and also a substantial fraction of the +70 and +100-mesh. The screen analysis of the material passing over the screen confirms this in the case of the +70-mesh, but only slightly in the case of the +100. Viscosity and weight were not affected appreciably, and "sediment" by the settling test was reduced from 15 to 10 per cent.

More interesting, perhaps, than the data given above is the fact that during six weeks' use of this screen the mud has never been completely replaced, and no appreciable volume of cuttings has accumulated in the ditch. In spite of this, the mud is still in excellent condition, so far as can be determined by observation and by simple field tests. It must be explained, however, that some of the drilling has been through fairly good mud-making material, which has been gradually replacing the original mud, and a limited amount of new material has been added from time to time.

While screens considerably finer than 30-mesh have been proved possible for some conditions, they are apt to be unsatisfactory, because they become clogged and because their maintenance cost is higher. Thick sticky mud goes through the finer screens with difficulty. A small amount of oil may also clog them. Finkey says that "the costs of maintenance of a screen are greater the smaller the width of the opening" and that screens are generally used in Europe only for material of grain size larger than 1 m.m. (approximately 12 mesh). Oil field experience has already confirmed the idea that the finer screens are much less durable, but a screen life of over 200 hours for 30-mesh monel screen cloth has been attained, and the hourly cost based on such a life is not large compared with the benefit that is being derived. Still better screen life is anticipated.

In judging the effectiveness of any sand-separating process for individual wells, it is desirable actually to measure the volume rate of removal of the coarse material and compare this rate with the volume rate of making hole. With vibrating screens this is easy, as the "tailings" from the screen can be caught easily and measured for a definite length of time. The rate of flow of tailings from screens is impressively large to look at or measure but surprisingly low when expressed in percentage of the mud stream, and just about accounts for the rate at which hole is being made. The rate of separation of cuttings in one case was just 1 quart per minute, which is less than 0.1 per cent of the total volume of mud being circulated but accounted for 40 feet of 12-inch hole per 24 hours. The amount of mud shoveled from ditches rarely begins to account for the volume of hole made.

Conclusions

While there are many points in the selection and use of drilling mud that are open to controversy, there are also many about which there is little doubt. The application of facts and principles that are known is resulting in a rapid improvement in general practice and there is little doubt that further intensive investigation will result in still further improvements in practice. Such improvements should greatly reduce cases of blowouts and stuck pipe, greatly increase life of pump parts and reduce expenditures for purchase, hauling and disposal of mud.

TABLE 4—EFFECTIVENESS OF VIBRATING SCREEN

	Sample—Before screening	Sample—After screening	Sample—Over screen
Total solids, by weight, per cent	32.9	32.7	69.1
Screen analysis of solids, per cent:			
On 30 mesh	0.15	Trace	32.60
On 70 mesh	2.20	1.95	34.80
On 100 mesh	2.45	2.10	1.10
On 200 mesh	5.90	6.30	2.75
On 325 mesh	3.70	3.15	0.50
Through 325 mesh	85.60	86.50	28.25
Weight, lbs.	73	73	
Viscosity, sec.	25	25	
Sediment, settling test, per cent	15	10	

TRAFFIC MEN'S MEETING

The Oil and Gas Well Supply Traffic Association, having among its members manufacturers of oil well outfits and supplies in the United States, will hold its fall meeting at the Palmer House, Chicago, October 21 and 22. T. L. Moriarity of the Continental Supply Co., St. Louis, is president of the association and V. E. Milsark, of the Parkersburg Rig & Reel Co., Parkersburg, W. Va., secretary.

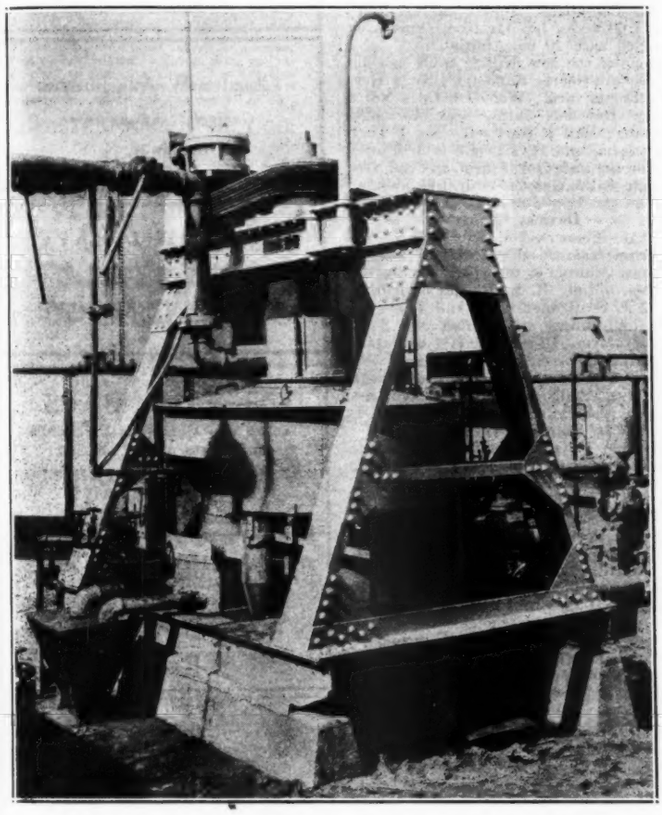
J. BOYD HARRELL DIES

SHREVEPORT, La., Oct. 11.—J. Boyd Harrell, production superintendent in Urania for G. W. Zoder, died at his home here following a protracted illness.

PROCESS OF REMOVING SAND FROM DRILLING MUD

(Continued from Page 90)

the machine and efficiency of operation, the Union conducted a number of experimental runs before its new plant was actually put into operation. In one of theses tests, mud weighing 80 pounds per cubic foot was fed to the separator at a rate in excess of 400 gallons per minute. It was found that the separation point for the sand was roughly at 80 mesh though there was a considerable concentration of finer sand in the sand fluid discharged. In another test, mud weighing 71 pounds per cubic foot was fed to the separator at the rate of 280 gallons per minute. During this run, 83 per cent of the sand of a screen size between 150 and 200 mesh was separated. In a third test run, mud weighing 74 pounds per cubic foot was fed at 144 gallons per minute and only a slight trace of 200 mesh material remained in the separated mud.



Close up of the separator used by Union Oil Co. in reclamation of rotary drilling mud.

It is quite evident from this series of tests that as the rate of feed is diminished, the fineness of separation is increased and if it is found that there is a tendency for sand finer than 200 mesh to accumulate in the mud, this accumulation can be eliminated by running the machine part time at a low rate of feed. Some mud is lost with the sandy fluid, the normal ratio of mud to sand discarded being about one to three. This ratio of mud to sand lost can be in turn decreased by adding a small water wash in the surrounding tank, most of which passes out with the sand.

Use Salt Water

The Union Oil Co.'s field department, in keeping with its past record, has made excellent use of the topographic and geographic features of its acreage at Playa Del Rey and is at the same time taking advantage of other important adjuncts to the maximum degree. Its drilling wells, for instance, are all being drilled with salt water indirectly supplied by the Pacific Ocean. A small natural lagoon, which empties into the ocean, extends around the Union's Del Rey lease and salt water from this reservoir is pumped to drilling wells through a suction line located below the low tideline. The movement of this water forms a very interesting feature in connection with the Union Oil Co.'s operations at Playa Del Rey as it makes a complete cycle before being returned to the point from which it was taken. It might not be amiss therefore to follow this cycle through to its conclusion. After being withdrawn from the natural canal which opens into the Pacific Ocean, this salt water is mixed with rotary drilling mud at one of the drilling wells where it is subsequently circulated to a depth of approximately 6,000 feet and later emerges with the sand and cuttings from the well. This rotary drilling mud and sand is then pumped to the Union's separating unit where it is processed and the recovered rotary mud and salt water pumped to the mud storage tank. After the rotary mud has settled out, the salt water is bled out and gravitated back into the same canal from which it was drawn. The salt water returned to the natural lagoon, incidentally, is absolutely free of any foreign substance. This removes any possibility of contaminating the adjacent bathing beaches. This is particularly important as the lagoon drains into the Pacific Ocean.

The Associated, Shell, Standard, Union and other major operators all have centralized mixing plants where rotary mud is compounded and reduced to a fluid state, but the Union's new installation at Playa Del Rey is the first plant of its kind constructed primarily for the reclamation of rotary drilling mud by the removal of sand and well cuttings. The rotary mud delivered from the Union's new reclamation plant to drilling wells is naturally heavy in weight but up to the present time no difficulty has been experienced in moving it to the most distant well located approximately 2,000 feet away. Drilling wells can discharge rotary mud and well cuttings into the receiving tank of the reclamation unit at any time without assistance from the central plant by using the usual mud pumps. Clean mud is delivered to drilling wells by using one of the two pumps located at the central plant.

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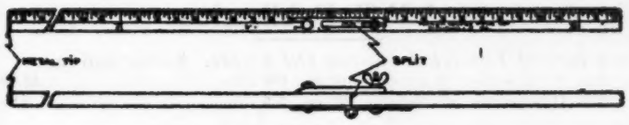

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KENTUCKY FIELDS

(Continued from Page 68)

Daviess, Hancock, McLean and Henderson Counties.

Ohio County Wells

The largest producer completed was the Leeper Oil Co.'s No. 4 on W. Hamilton farm, in the Buford Pool, of Ohio County, with an initial production of 300 bbls. In the same pool the Chester Oil Co. drilled in Nos. 9, 10 and 11 on the G. W. Patton farm, with initial production of 100, 150 and 50 bbls.

J. R. Pointer and others' No. 2 W. H. Lyons farm came in with a volume of 300,000 feet, and No. 2 for the same company on the W. H. Lyons and others farm is drilling.

Wood Oil Co.'s No. 4 J. T. Griffith farm is reported with a volume of 750,000 feet of gas, while Fuqua & Cooper's No. 1 W. F. Stephens farm is also a 750,000-foot gas producer.

In the Friendship Chapel area, T. P. Royal and others' No. 17 on the T. P. Royal 60 acres, not far from Dundee, is reported with 20 bbls. initial.

Some of the new drilling wells in Ohio County are George Randolph's No. 1 Herman Fuqua farm; Wood Oil Co.'s No. 2 Harry Reynolds farm, near Reynolds Crossing; Hall & Garrison's No. 1 Tuck Edge farm, and H. L. Ogle is drilling a well on the Pate Royal farm, and the New Domain Oil & Gas Co. is drilling another well on the Pate Royal 25 acres.

Daviess County

S. M. Sirman's No. 6 on the H. K. Atherton farm, in the Red Hill Pool, of Daviess County, is reported showing for 40 bbls. initial. R. R. Rhodes is drilling No. 2 J. F. Bruner farm, and James C. Ellis and others are drilling No. 2 C. Gregory farm. Daviess County operators are bringing in only an occasional well but standing by the shutdown movement that was inaugurated in July in the Owensboro Field.

Scattered Wells

In the Pellville Field of Hancock County, James C. Ellis and others' No. 5, on the Lincoln Richards 568-acre farm, was dry in the Jett sand, but reported good for 5 bbls. in the Barlow formation. H. C. Smith's No. 1 Virgil Crowe No. 1 farm, same field, was dry in the Jett and is drilling deeper.

An unusually good producer is reported from the Calhoun Field, in McLean County, in Cameron, Thompson and others' No. 1 on the Will Ashton farm, in the Grindstone Hill area, which has been reported good for 200 bbls. or better, and is one of the best so far found in that field.

Goldburg & Young drilled in No. 16 on the L. Purcell lease in the Red Hill Pool, of Daviess County, which looks good for around 30 to 35 bbls. initial.

Ellis & Bradshaw are getting down close to production depth on the Mart Hill farm, near Glenville, in McLean County. James C. Ellis and others are drilling No. 1 O. Mayo farm and No. 3 on the Lila Sandefur lease, both in McLean County.

Mel Root and others are drilling No. 1 on the Central State Bank land, in McLean County.

In the Niagara Field of Henderson County, the Niagara Drilling Co.'s well, formerly reported as P. E. Tichenour, on the Jim Cooper farm, produced 8 bbls. the first 24 hours. Worshman & King's No. 2 Latta-Yeaman farm was a dry hole. Wittmer Oil & Gas Co. has a dry hole in the same field in No. 1 John Griffin property. Niagara Oil & Gas Co. hit a duster in a second test on the Warren Wilson property, same field, and the same company's No. 1 A. W. Griffin property pumped 8 bbls. initial.

In Ohio County, Cornell and others are drilling No. 1 Tom Sandige farm. George F. Randolph is drilling No. 2 George Ray farm, and D. J. White and others are drilling No. 2 Lafe Payne farm.

In the Pellville Field, Hancock County, D. T. Bolling drilled in a dry hole on the Reverend Edge farm, near the center of the farm. Same party is drilling No. 2 on the J. T. Crow west 60 acres, same field. H. C. Smith drilled a dry hole 600 feet from the north line and 200 from the west line of the Virgil Crowe No. 1 farm, in the same area. Lowman, Daley and

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others' No. 6 on the James B. McGovern farm, same county, is in the sand and making a good showing.

Petroleum Exploration Co. is drilling on the Nancy Jane Craft farm, in Clay County, in the southeastern part of the State, for gas. Same company is drilling on the Lucy A. Nield farm, near Hayden, in Leslie County, and made a location on the Begley Coal Co.'s land, same county, for gas. Same company is drilling No. 7 on the Trabue heirs farm, in Lee County, in the eastern part of Kentucky.

PLANNING ADVERTISING NEEDED IN GAS SALES

(Continued from Page 74)

tember of the previous year, 96 furnaces were sold. It is conservatively estimated that 100 could be sold during the September, 1930, campaign. With this as a starting point it is then seen that these 100 furnaces could produce $20,000 estimated annual revenue. It is estimated that the total campaign cost will be $3,000, that the total merchandising profit will be $4,000.

There follows then a detailed plan for expending the funds. In preparing an advertising program and budgeting the expense, nothing is more essential than choosing the devices that are the best load builders and also the proper periods of the year to promote them. Let me give as an example one natural gas company's method. This company has approximately 160,000 domestic customers. From limited surveys and estimates their saturation of appliances is as follows:

SATURATION OF APPLIANCES

Device—	Saturation %	Number	Estimated annual revenue (each)
Gas ranges	94.4	150,392	$17.00
Hot plates	77.3	123,150	.50
Water heaters	69.8	111,202	20.00
Space heaters	*80.0	415,807	3.50
Furnaces and boilers	7.1	11,309	90.00

*Assuming an average of three space heaters per customer for 100 per cent saturation.

Income Per Customer

The average income per domestic customer is $45.60 per year. The total gross domestic income is approximately $7,296,000. However, if it had 100 per cent saturation of all the appliances I have just mentioned, the average domestic gas bill would be $130 per year instead of $45.60. The gross residential revenue would be increased thus by the difference between these two figures, or $84.40, multiplied by the 160,000 customers, giving $13,500,000. Of course, it is unreasonable to assume that they could ever get this entire potential business, but surely they should be able to look forward to getting half of it, which would mean an increase in revenue of $6,750,000, an amount almost equal to their present entire domestic revenue.

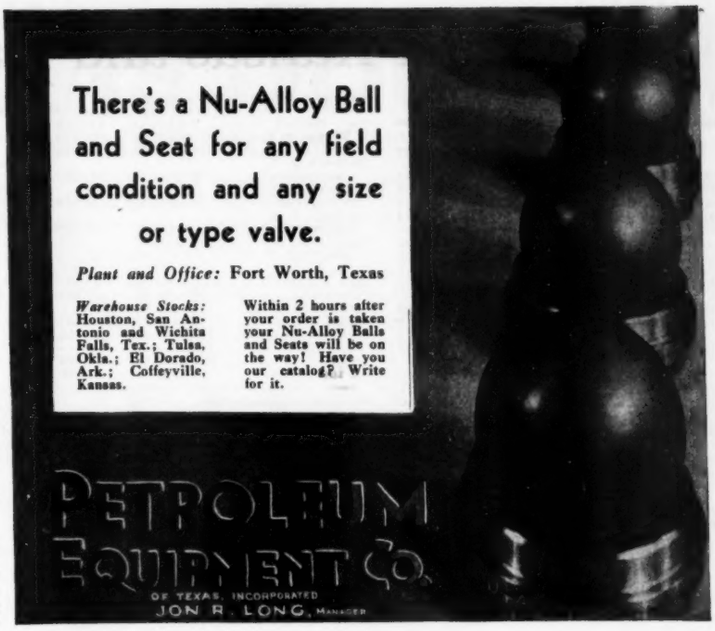
Referring again to the saturation figures mentioned, it is recalled that their greatest potential field is house heating and the next is water heaters. By knowing, roughly, the saturation figures, efforts can be intelligently applied in the direction which will do the most good. In passing, let me say that I understand that their advertising budget for house heating for 1931 is double that of this year.

DR. STEINER KILLED

HOUSTON, Tex., Oct. 11.—Dr. George Steiner, 35, Houston geologist and geophysicist, was burned to death in the crash of his cabin monoplane, 20 miles from Kountze, Tex., in Tyler County.

The ship, taking off in a wooded section, was dashed to the earth as its wing tip hit a pine tree. It caught fire within sight of Earl Callahan, one of Doctor Steiner's assistants, who was on the ground, and Callahan's efforts to drag his chief from the flaming cabin were unavailing.

Dr. Donald C. Barton, who worked with Doctor Steiner, said the latter had flown to the Tyler County location on business and was taking off to return to Houston when the accident occurred.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Oklahoma-Kansas and Eastern Pipe Line Report

OKLAHOMA-KANSAS

Pipe Line Runs for the Month of July, 1930

	Month bbls.	Daily average bbls.
Prairie P. L. Co.*	3,251,900	104,900
Gulf P. L. Co.	1,465,653	47,279
Texas P. L. Co.	753,631	24,278
Magnolia P. L. Co.	1,615,548	52,114
Empire P. L. Co.	1,986,685	64,087
Cosden P. L. Co.	570,196	18,393
Sinclair P. L. Co.*	3,069,000	99,000
Oklahoma P. L. Co.	3,202,018	103,291
Other lines*	5,657,996	182,516
Total July	21,571,630	695,858
Total June	23,520,270	784,012
Difference	1,948,740	88,154
Shipments		
Prairie P. L. Co.†	4,811,200	155,200
Gulf P. L. Co.	1,488,337	48,011
Texas P. L. Co.	1,535,288	49,525
Magnolia P. L. Co.	1,940,106	62,584
Empire P. L. Co.	2,037,306	65,720
Cosden P. L. Co.	480,901	15,513
Sinclair P. L. Co.†	3,312,208	106,845
Oklahoma P. L. Co.	3,336,757	107,637
Other lines*	4,650,000	150,000
Total July	23,592,103	761,035
Total June	25,430,161	847,672
Difference	1,838,058	86,637
Stocks		
Prairie O. & G. Co.*		37,112,000
Gulf P. L.-Gypsy Oil Co.		8,066,982
The Texas Company		4,415,889
Magnolia Petroleum Co.		6,549,846
Empire P. L. Co.		5,827,318
Mid-Continent Pet. Corp.		3,696,046
Sinclair Crude Oil Pur. Co.*		20,484,000
Oklahoma P. L. Co.*		3,101,774
Carter Oil Co.		9,569,730
Other lines		24,810,000
Total July		125,633,063
Total June		124,312,916
Difference		679,847

*Estimated. †Prairie and Sinclair shipments include Texas crude oil.

EASTERN PIPE LINE REPORT FOR MONTH OF AUGUST

Runs from Wells

In the following table will be found the regular receipts from wells by various pipe lines in New York, Pennsylvania, West Virginia, Ohio, Kentucky, Illinois, Indiana and Michigan for July and August:

	July, 1930	Aug., 1930
Nat. Transit	339,540.44	118,378.49
S. W. Pa. P. L.	92,523.81	70,719.58
Eureka P. L.	356,585.39	272,439.66
Buckeye P. L. (Macksburg)	371,564.16	320,091.51
Buckeye P. L. (Cleveland)	10,605.56	11,370.77
Buckeye P. L. (Lima, etc.)	105,474.77	91,595.80
Indiana P. L.	4,322.54	3,922.81
Cumberland P. L.	190,812.48	169,132.16
N. Y. Transit	30,601.75	25,399.13
Tide Water P. L.	31,075.50	26,087.89
Pure Oil	266,204.65	255,892.62
Paragon Dev.	12,241.51	
Stoll Oil Ref.	3,568.69	3,500.15
Bradford Trans.	340,930.40	214,490.88
Total	2,156,562.15	1,683,026.75
Daily average	69,921.36	54,291.51

Note—Indian Refining Co. had other receipts of 371,343.40 bbls.

Petroleum Deliveries

The following tables exhibit the shipments or regular deliveries of various pipe lines in New York, Pennsylvania, West Virginia, Ohio, Kentucky and Indiana for July and August:

	July, 1930	Aug., 1930
Nat. Transit	446,849.71	479,192.75
S. W. Pa. P. L.	259,734.68	256,396.24
Eureka P. L.	265,118.12	273,684.53
Buckeye P. L. (Macksburg)	205,233.24	160,065.90
Buckeye P. L. (Cleveland)	2,195.10	1,713.66
Buckeye P. L. (Lima, etc.)	1,297,607.97	1,394,277.55
Indiana P. L.	1,364,012.03	1,335,998.03
Cumberland P. L.	254,880.86	205,045.71
Southern P. L.	68,841.69	69,211.54
N. Y. Transit	171,500.30	172,930.08
Northern P. L.	182,471.98	125,321.25
Tide Water P. L.	340,105.72	504,721.54
Pure Oil	114,748.17	107,492.59
Paragon Ref.	114,435.64	
Indian Ref.	393,576.63	375,829.22
Paragon Dev.	12,102.83	
Bradford Trans.	440,403.94	331,474.90
Tuscarora Oil	466,572.46	502,354.86
Total	6,419,941.08	6,270,704.44
Daily average	207,094.88	205,506.59

Gross Stocks

The gross stocks held by various pipe lines in the oil producing sections of New York, Pennsylvania, West Virginia, Ohio, Indiana and Kentucky at the close of July and August:

	July, 1930	Aug., 1930
Nat. Transit	825,072.45	808,225.58
S. W. Pa. P. L.	480,083.44	490,266.60
Eureka P. L.	1,707,911.42	1,603,479.15
Buckeye P. L. (Macksburg)	750,780.45	694,516.87
Buckeye P. L. (Cleveland)	63,047.96	66,815.01
Buckeye P. L. (Lima, etc.)	5,030,489.35	5,004,621.10
Indiana P. L.	771,951.56	836,606.05
Cumberland P. L.	585,644.30	547,844.28
Southern P. L.	231,660.33	245,676.27
N. Y. Transit	152,450.75	144,696.68
Northern P. L.	338,838.05	416,121.94
Tide Water P. L.	1,193,758.34	1,043,300.56
Pure Oil	349,233.02	507,198.43
Paragon Ref.	20,150.83	
Indian Ref.	165,643.89	161,817.52
Paragon Dev.	5,345.17	
Tuscarora	278,810.90	278,425.17
Bradford Trans.	337,709.63	197,440.63
Total	13,268,562.84	13,047,051.84
Decrease	128,292.62	221,511.00

Grades of Oil

The following table shows the amount of the different grades of oil held by the eastern pipe lines at the close of July and August showing gross stocks of the above fields:

	July, 1930	Aug., 1930
Pennsylvania	4,409,262.91	4,044,608.48
Lima	786,761.50	815,257.62
Kentucky	719,649.49	594,501.57
Mid-Continent	6,947,051.84	7,051,195.35
Illinois	67,354.68	44,760.06
Michigan	338,543.42	496,728.56
Total	13,268,562.84	13,047,051.84

Daily Average Runs

The following table shows the daily average runs of the Pennsylvania, Lima and Kentucky oil fields for the past four years:

	1927	1928	1929	1930
January	56,209	52,904	51,749	76,907
February	61,298	57,902	51,833	79,256
March	63,247	57,485	54,252	76,688
April	60,927	56,812	58,444	84,536
May	60,284	62,067	59,902	80,548
June	62,757	58,230	58,833	75,430
July	58,674	57,144	66,087	68,921
August	60,870	57,745	66,087	54,291
September	60,285	55,487	67,315	.....
October	147,080	58,100	76,093	.....
November	57,276	54,865	74,831	.....
December	53,089	52,025	74,561	.....

Daily Average Shipments

The following table gives daily average shipments from the Pennsylvania, Lima and other fields for the past four years:

	1927	1928	1929	1930
January	141,227	146,465	165,721	217,623
February	138,534	167,368	159,387	224,855
March	133,777	158,883	161,474	228,846
April	140,228	172,935	169,737	241,845
May	144,594	180,559	184,281	248,383
June	149,772	188,024	185,404	234,491
July	151,860	189,470	194,763	207,094
August	138,663	192,853	184,946	205,506
September	144,313	194,138	201,214	.....
October	147,036	176,000	191,367	.....
November	150,975	176,898	202,743	.....
December	144,504	173,572	186,267	.....

Gross Stocks

In the following table will be found the gross stocks of the various lines of the Pennsylvania, Lima and Kentucky oil fields, including oil received from other lines at the close of each month for the past three years:

	1928	1929	1930
January	13,276,710	7,596,564	13,320,046
February	12,180,419	8,735,835	12,991,561
March	12,239,725	9,002,058	12,247,217
April	11,740,125	8,978,172	12,233,961
May	11,602,468	8,963,560	12,062,953
June	11,287,678	8,921,275	12,396,855
July	10,819,331	9,211,595	13,268,562
August	10,336,743	9,440,643	13,047,051
September	9,660,910	9,443,067	.....
October	9,229,709	9,441,101	.....
November	8,366,553	9,868,538	.....
December	7,539,555	11,253,953	.....

The Illinois Field

The following table gives the report of the Illinois Pipe Line Co. in Illinois:

Gross stocks, August 31	2,004,602.13
Runs from wells	565,554.24
Other receipts	151,451.54
Regular deliveries	319,777.19
Other deliveries	455,555.58

The amount of Illinois oil run by Tide Water Pipe Co. in August was 26,087.89 bbls. Deliveries were 55,965.24 bbls. Adding these figures to those of the Illinois Pipe Line Co. makes the runs and deliveries as follows:

	Runs	Deliveries
1930—		
August	594,642.12	375,742.43
1929—		
February	517,320.17	503,387.76
March	728,319.67	586,049.60
April	515,374.27	654,297.96
May	608,981.60	673,812.83
June	568,454.70	813,845.97
July	611,106.79	823,159.44
August	625,351.99	746,425.06
September	582,457.66	669,947.72
October	672,302.83	558,558.68
November	565,108.75	427,064.63
December	548,924.41	489,368.91
1930—		
January	543,387.95	498,293.93
February	548,416.33	414,536.59
March	631,944.49	469,119.52
April	530,074.22	509,304.60
May	605,147.37	504,069.84
June	572,662.57	468,658.81
July	604,529.54	388,454.47

Tide Water Pipe Co., Ltd., also delivered in August 175,346.18 bbls. Oklahoma oil.

AVERAGE DAILY RECEIPTS OF CALIFORNIA CRUDE AND REFINED OIL AT ATLANTIC AND GULF PORTS

Average barrels per day in 1929-30—	ATLANTIC PORTS Baltimore	Boston	New York	Philadelphia	Others	Total	GULF COAST PORTS Galveston	New Orleans Baton Rouge	Port Arthur Sabine Pass	Tampa	Total	Total all ports
August	20,289	3,129	35,226	18,903	5,548	83,194	.....	.....	.....	.....	13,161	96,355
September	19,433	.....	31,834	11,900	6,200	69,367	.....	.....	.....	.....	4,800	74,167
October	9,065	4,677	42,065	12,000	9,677	77,484	.....	.....	.....	.....	4,097	81,581
November	18,900	3,167	41,667	14,699	3,767	82,200	.....	.....	.....	.....	2,400	84,600
December	12,968	.....	46,129	13,613	7,325	79,935	.....	.....	.....	.....	2,335	82,290
January	18,484	1,936	34,267	22,323	9,516	86,516	.....	.....	.....	.....	2,258	88,774
February	7,678	.....	24,714	14,321	5,000	51,714	.....	.....	.....	.....	2,607	54,321
March	10,548	3,065	28,871	8,774	22,484	73,742	.....	.....	.....	.....	805	74,548
April	7,767	.....	14,369	11,600	7,433	41,167	.....	.....	.....	.....	7,600	48,767
May	5,194	8,451	28,161	9,484	2,774	54,064	.....	.....	.....	.....	774	54,838
June	8,300	.....	33,933	20,767	2,333	65,333	.....	.....	.....	.....	2,400	67,733
July	17,355	7,774	43,419	23,839	6,452	98,839	.....	.....	.....	.....	4,645	103,484

AVERAGE DAILY IMPORTS OF CRUDE AND REFINED OIL AT PRINCIPAL UNITED STATES PORTS

Average barrels per day in 1929-30—	ATLANTIC PORTS Baltimore	Boston	New York	Philadelphia	Others	Total	GULF COAST PORTS Galveston	New Orleans Baton Rouge	Port Arthur Sabine Pass	Tampa	Total	Total all ports
August	33,337	14,355	162,644	30,936	20,355	261,677	4,226	12,742	.....	1,484	18,452	280,129
September	32,967	9,000	136,633	54,300	32,900	265,800	6,900	23,900	5,367	1,233	36,500	302,300
October	29,936	10,519	137,096	38,150	38,644	264,355	6,613	13,388	11,064	4,419	35,484	299,839
November	23,633	12,900	126,200	41,100	28,200	237,033	2,333	12,533	6,667	2,500	23,933	260,966
December	29,774	15,387	133,742	31,000	23,775	253,678	5,548	16,484	6,613	1,774	30,419	284,097
January	21,161	10,678	134,581	38,677	43,806	248,903	4,322	6,452	.....	548	11,323	260,226
February	24,500	14,714	147,357	36,036	39,786	262,393	2,821	11,072	3,500	1,964	19,357	281,750
March	28,255	3,839	151,806	35,645	34,903	255,548	4,323	11,645	839	2,419	19,226	274,774
April	31,400	8,933	123,500	40,433	19,434	223,700	.....	7,400	2,433	4,167	14,000	237,700
May	34,129	9,322	174,194	39,291	28,226	275,161	8,194	11,548	2,935	1,323	24,000	299,161
June	51,533	15,667	121,067	45,033	25,033	258,333	4,413	17,267	2,167	1,333	25,300	283,633
July	42,097	9,548	154,968	37,935	36,033	280,580	5,678	9,161	2,097	2,387	19,323	299,903

GROSS PRODUCTION OF CRUDE OIL IN THE UNITED STATES FOR 12 MONTHS

(In Barrels of 42 Gallons)

1929-30—		California	Oklahoma	Texas	Kansas	Arkansas	Louisiana	Rocky Mts.	Eastern	Total
August:	Month	27,233,353	22,429,522	27,491,362	3,816,555	2,086,083	1,764,973	2,478,016	4,363,000	91,662,864
	Daily average	878,495	723,532	886,818	123,115	67,298	56,934	79,936	140,742	2,956,866
September:	Month	26,104,264	21,299,490	26,067,065	3,780,690	1,959,720	1,718,250	2,347,020	4,075,000	87,351,499
	Daily average	870,142	709,983	868,902	126,023	65,324	57,275	78,234	135,917	2,911,716
October:	Month	26,395,160	20,821,646	26,413,167	3,429,468	2,000,027	1,956,326	2,392,952	4,462,000	88,389,746
	Daily average	867,586	671,666	852,004	110,628	64,517	63,107	77,192	141,358	2,851,282
November:	Month	21,317,540	19,193,760	24,396,024	3,450,560	1,911,060	1,853,565	2,350,110	4,029,000	78,981,629
	Daily average	710,585	639,792	813,868	114,352	63,702	61,785	78,337	134,300	2,632,720
December:	Month	21,705,554	20,021,376	25,409,822	3,549,066	1,917,071	1,878,352	2,378,754	4,168,100	81,299,596
	Daily average	700,179	646,156	819,994	114,486	61,841	60,592	76,734	134,455	2,622,568
January:	Month	21,933,242	20,303,854	25,284,353	3,272,197	1,817,685	1,780,969	2,151,090	4,216,000	81,309,519
	Daily average	709,137	671,064	816,624	105,587	58,635	57,451	69,390	136,000	2,622,888
February:	Month	20,885,660	17,977,434	23,314,637	2,965,704	1,608,376	1,738,425	2,027,554	3,780,000	74,298,410
	Daily average	746,916	642,658	833,558	106,918	57,442	62,087	72,429	135,000	2,653,517
March:	Month	19,699,979	19,113,306	25,503,330	3,504,395	1,817,871	1,943,093	2,337,028	4,231,500	78,149,252
	Daily average	635,483	616,526	822,679	113,045	58,641	62,680	75,388	136,500	2,520,942
April:	Month	18,763,743	19,541,310	24,799,768	3,734,253	1,734,460	1,909,552	2,334,810	4,134,000	76,946,596
	Daily average	625,625	651,377	826,658	124,475	57,482	63,652	77,827	137,800	2,564,887
May:	Month	19,044,444	20,587,503	26,214,068	3,978,285	1,659,895	1,914,390	2,565,219	4,403,000	80,265,804
	Daily average	614,337	664,113	845,615	128,335	53,545	61,761	82,749	142,000	2,589,445
June:	Month	18,020,795	19,754,900	25,643,705	3,765,060	1,704,660	1,933,621	2,619,190	3,880,000	77,211,331
	Daily average	600,693	658,490	854,791	125,503	56,822	64,187	88,973	129,300	2,573,711
July:	Month	18,802,034	18,032,514	25,910,939	3,541,409	1,712,680	2,079,769	3,275,894	3,844,000	77,200,319
	Daily average	606,517	581,694	835,835	114,235	55,280	67,089	105,674	124,000	2,490,328
	Total 12 months	260,466,758	239,646,435	307,147,290	42,763,743	21,919,988	22,461,185	29,158,267	49,604,800	973,166,765